JULY, 1955

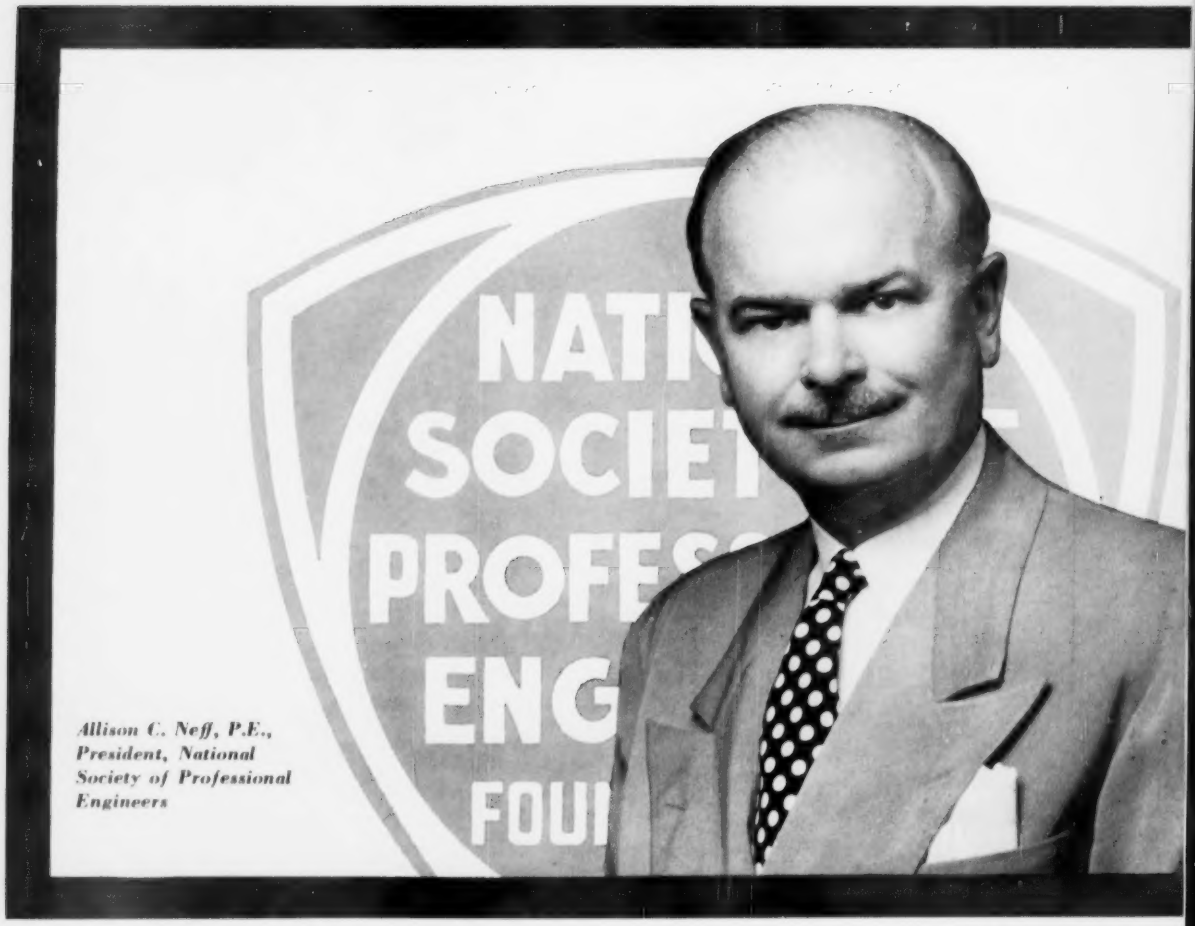
American Engineer

IN THIS ISSUE . . .

- **A Special Message from NSPE's New President**

ALLISON C. NEFF, P.E.,

Vice President, Armco Drainage & Metal Products, Inc.



Allison C. Neff, P.E., President, National Society of Professional Engineers

Full Report on Recent Engineer-in-Industry Conference in Philadelphia

Color Blindness and Engineering by Israel Dvorine, O.D.

Wanted: Professional Engineer Executives by J. L. Handy

***Plus* "From Washington" and Many Other Features**

A question often asked:

Me...an Aircraft Design Engineer?

A question often answered:

Yes, Lockheed in California trains you—at full pay

Three engineers who have made the transition to Aircraft Design through Lockheed's Training Program: E. A. Phelps (top) was a Structural Steel Engineer in Denver, Colorado; H. G. Hauser (center) was a Test Equipment Design Engineer in Grand Rapids, Michigan; R. W. Tetamore was a Mechanical Engineer in Rochester, N. Y.

Engineers find the step up to Aircraft Design an interesting, rewarding experience in Lockheed's Training Program for Design Engineers.

It's a program adapted to the individual. It adapts you to Lockheed—and Lockheed to you. For the program not only trains you for Aircraft Design, it enables Lockheed to assess your special abilities, assign you to the project best suited to your talents.

Aircraft engineering experience is not necessary to qualify. Lockheed is interested in your knowledge of engineering principles, your aptitude, your experience in other engineering fields.

In the program you receive extensive orientation. When necessary you attend Lockheed engineering classes. You engage in on-the-job training. You learn to work with closer tolerances. You become more weight-conscious. You learn that fresh thinking, new ideas are welcomed and rewarded.

Your program may take three weeks – or three months. It depends on your experience and assignment.

After the Training Program is completed

you join the most diversified Design effort in the history of Lockheed.

46 major projects are in motion – including turbo-prop and turbo-jet transports, vertical rising aircraft, jet trainers, extremely high-speed fighters, bombers, nuclear applications to aircraft.

In career terms this diversification means more scope for your ability; more opportunity for promotion; more job security with so many projects in progress.

You are invited to write for more information on Lockheed's Training Program for Design Engineers. Address: Dept. DE-2-7 E. W. Des Lauriers, Design Engineer Training Program, Lockheed Aircraft Corporation, Burbank, California.

Now in effect: Increased salary rates; Increased overtime scales; Increased employee benefits; A travel and moving expense program that enables you and your family to move to Lockheed in California at virtually no expense or trouble.

Lockheed

AIRCRAFT CORPORATION

CALIFORNIA DIVISION

BURBANK

California

American Engineer

JULY
1955

American Engineer
21st YEAR OF PUBLICATION
1938 – 1955

Kenneth E. Trombley, Editor

Mary Margaret Milbrath, Assistant to the Editor

Vincent F. Waters, P.E., Chairman, Publications Committee, NSPE

N.S.P.E. Officers

Allison C. Neff, P. E., Pres.
Post Office Box 170
Middletown, Ohio

R. J. Rhinehart, P. E., Vice Pres.
Arkansas Power & Light Company
Pine Bluff, Ark.

Louis F. Frazza, P. E., Vice Pres.
225 Bamford Avenue
Hawthorne, N. J.

Virgil E. Gunlock, P. E., Vice Pres.
Post Office Box 3555
Chicago 54, Ill.

Warner Howe, P. E., Vice Pres.
76 Porter Building
Memphis, Tennessee

Lindley R. Durkee, P. E., Vice Pres.
511 New World Life Building
Seattle, Wash.

Garvin H. Dyer, P. E., Vice Pres.
c/o Missouri Water Company
123 West Kansas Street
Independence, Mo.

Clarence T. Shoch, P. E., Past Pres.
901 Hamilton Street
Allentown, Pa.

Russell B. Allen, P. E., Treas.
4610 Hartwick Road
College Park, Md.

Paul H. Robbins, P. E., Ex. Dir.
1121 15th Street, N. W.
Washington 5, D. C.

In the whole range of scientific and technological activities, there is no substitute for the first-rate man. Ten second-rate men cannot replace him.

— Dr. James B. Conant

BPA
Member, Business Publications Audit

• SPECIAL ARTICLES

A Message from NSPE President Neff ... 11
Allison C. Neff, P. E., the Society's new chief executive, says that the year ahead will present challenge and responsibility for NSPE.

A Full Report of NSPE's Engineer-in-Industry Conference in Philadelphia ... 13

Color Blindness and Engineering ... 16
By Israel Dvorine, O.D.

A Report of the Recent Board of Directors Meet ... 20

Wanted: Professional Engineer Executives ... 31
By John L. Handy

• REGULAR FEATURES

Letters ... 4
Professional News Briefs ... 6
From Washington ... 27
NSPE Believes ... 30
Professional Postscripts ... 34
Strictly Business ... 35
With Our Members ... 36
Book Looks ... 44

New Processes ... 26
Professional Directory ... 38, 39, 40, 41, 42
New Literature ... 46
Classified ... 47 Advertisers' Index ... 49
What's New—New Products of Interest ... 50

ADVERTISING INFORMATION:

R. A. Oliver, Advertising Director
American Engineer, 1121 Fifteenth Street, N.W., Washington 5, D. C.
Telephone ADams 4-1622

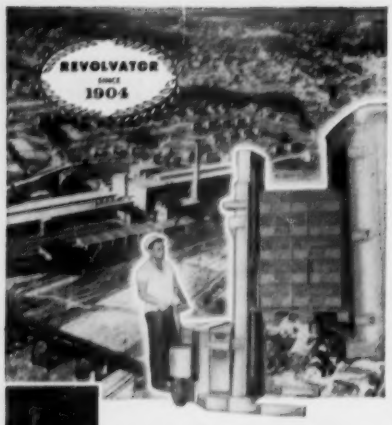
NEW YORK:
Austin LeStrange Co., Inc.
420 Lexington Avenue
New York 17, N. Y.
MUrray Hill 5-3277

CHICAGO:
LeStrange Co., Inc.
185 North Wabash Ave.
Chicago 1, Illinois
DEarborn 2-0248

LOS ANGELES:
J. W. Conrow & Co.
1175 Woodbury Rd.
Pasadena, Calif.
SYcamore 7-5365

The American Engineer is published monthly by the National Society of Professional Engineers, 1121 15th St., N. W., Washington 5, D. C. Entered as Second Class Matter at the Post Office, Washington, D. C., under act of March 3, 1879. Copyright, 1955, by the National Society of Professional Engineers. Not responsible for opinions expressed in signed articles. Subscription Rates: $2 per year in advance to members of NSPE and its Affiliated Societies; $3 per year in advance to non-members in U. S. A. and its possessions, Canada and Mexico. Foreign, $4 per year. Single copy, 35c. Vol. 25, No. 7.

NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS
FOUNDED 1934



Wherever narrow aisles and high stacking is required.

High Lift Go-Getter — a real brute for work.

YOU BENEFIT...

By Over 50 Years of Diversified experience.

Revolvator Go-Getter Lift Trucks have been used to solve a great range of materials handling problems. Quiet, smooth, powerful operation; easy maneuverability; the freedom from heavy maintenance; overall simplicity of construction of these Revolvator Go-Getters have made the name Revolvator synonymous with peak efficiency in materials handling.

Today write for full information.

REVOLVATOR CO.
6782 Tonnele Ave., No. Bergen, N. J.

A *New* WAY TO

IDENTIFY
REFERENCE POINTS
Permanently-

FOR PROPERTY LINES
RIGHTS-OF-WAY
PIPE LINES

Simply DRIVE

Can't Rust!

thick copper covering molten welded to steel core

Copperweld
SURVEY MARKERS

Write for Bulletin 144

Copperweld* Survey Markers provide permanent, easy-to-locate points of reference that eliminate troublesome disputes. Economical and easy to drive, they can't rot or rust—won't splinter, bend or break. Bronze head can be center-punched and stamped for identification. If larger head is needed, a 4" adapter is available.

*Trade Mark

Standard length is 3 feet—other sizes made to order. Packed 10 markers to a carton.

COPPERWELD STEEL COMPANY
WIRE AND CABLE DIVISION Glassport, Pa.

Letters to the Editor

Military Service . . .

Dear Editor:

I note in the June issue of the AMERICAN ENGINEER that Mr. Frank Wadsworth of Dresden, New York, refers to a letter of mine published in the March issue relative to military deferments.

I hardly can agree with Mr. Wadsworth that we take a negative position. When he speaks of military opportunities those need to be well defined.

We are ready to grant that every young man owes service to his country in return for his privileges of United States citizenship. The difference comes in regard to the interpretation of the word service. If we want to think of maximum service and maximum security of this country, we have to think far beyond just the military service alone. I think the majority of people will admit that our security lies in keeping ahead of our opponents in the fields of science and engineering, and if we lose out on that score, it does not make too much difference how many bodies we have in the traditional services, they will be of minor consequence.

Many others, like myself, are concerned with having the preservation of our top creative talent so that we may have maximum security. Taking this possible talent and killing it by the types of services which many young men get assigned to is a great waste of our manpower resources as well as a sacrifice of national security.

The services should have first call for those men of top caliber and educated to perform at a top level where such talents are needed by the services. Wherever these younger men are placed in the services at a much lower level than their capacities and talents call for, we lose in human resources and in national security.

The experiences mentioned by Mr. Wadsworth are not the best for creative talent, and professional engineering is a creative profession. Such experiences may operate to destroy creative talent.

We are supposed to have selective service but in my opinion it is not very selective and we have a variety of policies dependent upon the local boards. One policy, rather than a variety, would be some improvement but what we need is a full recognition of the vital defense needs of this country and then we should move in to meet those needs. I do not call that a negative approach. I think that it is positive and the neglecting of that approach can be called negative. I can only look upon the so-called equality of sacrifice about which politicians and sometimes others like to speak as a negative approach.

Political thinking calls for such statements as equality of sacrifice but the best for the country calls for a real application of selective service in which each man serves to the limit of his talents for the national good at the point where he can make the best contribution.

The national reserve plan would appear to be a considerable improvement over the present operation of selective service but that seems to have bogged down in political maneuvering. The thing that I and others have continuously advocated has been to get everything concerning our manpower problem and manpower resources out of the political stream and over to where it can be handled for the good of the country and where no other criterion will come into the picture except what is for the best interest of the country.

R. L. SWEIGERT, P.E.,
Dean, Graduate Division,
Ga. Institute of Tech.,
Atlanta, Ga.

The "Shortage" . . .

Dear Editor:

I thought (your readers) might be interested in a copy of the following letter that I sent to the three members of the House of Representatives (Yates of Ill., Thomas of Texas, and Wickersham of Okla.) who were mentioned in the "From Washington" feature in the May issue:

"Dear Mr. Wickersham:

"In the May issue of *American Engineer* is an article concerning recent discussions (in a sub-committee of the House Appropriations committee) of the 'shortage' of engineers. I was pleased to note that the 'shortage' was questioned. . . .

"When there is a real shortage, wages will rise high enough to encourage more men to stay in the profession and industry will treat engineers as professional people, not just as more labor. Until a larger portion of our graduates stay in the profession, we do not need more.

"I suggest the following approaches if you wish to obtain data on your own.

1. Investigate the action taken by some companies in placing non-engineers in positions formerly thought to require engineers.
2. Investigate the action taken by some companies and some engineering societies to better utilize the engineers they have.
3. Investigate the type of work done by engineers in unions as compared with that done by unorganized engineers, to see if the union members are doing engineering grade work, or if they represent a potential supply of engineers providing technicians take over their present jobs.
4. Determine percentage of graduate engineers still in engineering after some period of time.
5. Establish the pay rates that certain percentages of the employed engineers exceed and compare these with the pay rates for various trades and vocations and with the national average income and the national distribution of income. (If you do this I would be interested in the data. Particularly the rate that 10%, 20%, 30%, 40% and 50% of the wage earners exceed.

For one large company
25% exceed $8750/yr. or $4.20/hr.
50% exceed $7150/yr. or $3.44/hr.
75% exceed $6500/yr. or $3.12/hr.

"If on the basis of the information suggested above, you find that the demand exceeds the supply, then action should be taken, but if you find, as many of us believe, that the shortage is not real, then you do well to question any further claims that one exists. . . ."

JOHN M. GRAHAM, P.E.,
Chicago, Ill.

The PROOF of a building's age is behind these doors!

Five seconds behind these doors, and you *know* your building's age!

Notice the plumbing fixtures. If they are off-the-floor . . . your building is new forever. If not . . . it is obsolete when the doors first open.

Off-the-floor fixtures installed today will never give away the age of your buildings. Year after year, they will continue to contribute to the desireability—and marketability—of your investment. They add spaciousness. They free washrooms of litter-traps and breeding grounds for bacteria. They do away with obstacles to easy cleaning and hospital-like sanitation.

In today's major buildings, more than 800,000 such fixtures are supported on the ZURN SYSTEM®. You should look into the reasons why. You will find, among other things, that Zurn-engineered, patented features simplify installation and alignment. The entire stress is on the Zurn fitting—not on the wall. And ZURN SYSTEMS never interfere with future alterations, but often make them easier.

Buildings age fast enough. Do not give yours a running start by designing washrooms that are obsolete when the doors first open.

Before planning your next building, be sure to write for the helpful new booklet, "Behind Closed Doors." It is your guide to modern, sanitary washroom decor. 110-1

The ZURN ZERO ZONE® is created by mounting off-the-floor plumbing fixtures on behind-the-wall ZURN SYSTEMS. This permits the highest degree of restroom sanitation to be attained and maintained. All major plumbing manufacturers make fixtures to fit the ZURN SYSTEM.

COPYRIGHT 1955 — J. A. ZURN MFG. CO.

J.A. ZURN MFG. CO.

PLUMBING DIVISION

ERIE, PA., U. S. A.

PROFESSIONAL NEWS IN CAPSULE FORM

A Roundup of Late Events for Professional Engineers

Make Civic Contribution, Hooven Tells Engineers

Engineers have a responsibility to play a more active role in community life as their contribution to the maintenance of Western Civilization, said Morris D. Hooven speaking recently at the annual meeting of the American Institute of Electrical Engineers. Mr. Hooven, presidential nominee of the AIEE and also a member of NSPE, urged the engineers to take a position of leadership in the realm of civic affairs.

"Some twenty civilizations have failed," he said. "This world is not such a simple one that one reason for failure can be given for all. But through these disintegrations runs a common thread. The 'ingenious ones' (the engineers) did not look beyond their interesting puzzles. The brightest minds stuck to the developments of techniques. I suspect few of them paid too much attention to the life which surrounded them."

ASSURE ACCURACY
REDUCE COSTS
by using
WARREN-KNIGHT
TRANSITS and LEVELS

Special features of design and construction assure the greatest value per dollar of investment.

A MODEL FOR EVERY NEED — 10 DAY TRIAL

SERVICES FOR THE ENGINEER

Instruments—New or Rebuilt
Engineering Equipment and Supplies
Rental—any length of time
Repairs—any make
Assistance—by P.E. in making your selections

Send for free Catalog AE-57

WARREN-KNIGHT
136 N. 12th St., Phila. 7, Pa.

❁

J. W. Graham Is Named Carnegie Tech Student Dean

Dr. John W. Graham, Jr., a former president of the Pittsburgh Chapter of the Pennsylvania SPE, has been named Dean of Students at the Carnegie Institute of Technology, according to an announcement by Dr. J. C. Warner, Carnegie president.

Dr. Graham, who first joined the Tech faculty as an instructor in Civil Engineering in 1946, has been assistant dean in the College of Science and Engineering since 1951. He is a graduate of Ohio State University with a bachelor's degree in Civil Engineering, and he received a professional degree in the same field from Princeton University. In 1953, the Pittsburgh Chamber of Commerce, in conjunction with *Time* magazine, selected him as one of the one hundred outstanding young men of that city.

In addition to holding NSPE membership, Dr. Graham also belongs to the American Society for Engineering Education, the American Society of Civil Engineers and the American Concrete Institute.

"Sentimental reasons, you know—he was here when the place was founded."

❁

Middle Management Salaries

The average American "middle management" business executive receives a salary of $11,200 a year, according to the American Management Association's fourth annual survey of middle management compensation, which has just been released.

The survey covered compensation paid by over 100 United States companies during 1954 to approximately 3,200 executives in "middle management" jobs (those between the policy-making level and that of general foreman or supervisor). Among the positions included were those of chief project engineer, plant manager, district sales manager, chief cost accountant, office manager, labor relations manager, and divisional purchasing agent.

Two thirds of the salaries reported fell within the $7,000 to $14,900 range, and there was very little practical variation as a result of geographical location, the Association said. There were variations, however, with responsibility and among departments; for instance, the average annual compensation of regional and district sales managers was determined to be $12,000, compared to $14,000 for factory managers and factory superintendents.

Only 36 per cent of the executives surveyed received bonuses last year, and even fewer were eligible for stock purchase plans.

The companies included in the study were chiefly manufacturers of durable and nondurable goods, though there also were banks, utilities, and various types of commercial and service firms.

❁

Ohio State Honors Ralph M. Hardgrove

Ralph M. Hardgrove, of North Canton, Ohio, a member of the Ohio SPE and NSPE, was honored at the June 10th commencement exercises of Ohio State University with the presentation of the school's Benjamin G. Lamme Medal. One of the

university's top awards, the gold medal is bestowed annually on a graduate of one of Ohio State's technical departments in recognition of "meritorious achievement in engineering or the technical arts."

Presently a research consultant to The Babcock and Wilcox Co., Alliance, Mr. Hardgrove is a 1914 graduate in Mechanical Engineering. Internationally known for his work in the field of pulverized-coal firing and steam generation, he holds 46 U. S. patents as sole inventor and is credited with an additional 35 patents as co-inventor.

❁

International Prize Awarded to Steinman

Dr. David B. Steinman, consulting engineer and well-known bridge designer, has been awarded the *Grand Prix International de l'Invention* (International Grand Prize for Invention) in recognition of his inventive and scientific contributions and achievements in the design and construction of some of the world's most outstanding bridges.

The award was made at Paris on June 3 by the unanimous vote of the Jury of the Permanent Committee of the *Grand Prix*. The Permanent Committee was founded at Paris in 1954 by representatives of national and international organizations of scientists and inventors. The *Grand Prix International*, of which Dr. Steinman is the first recipient, will be the highest honor the group will bestow.

An officer of the Committee will bring the medal and diploma of award to the United States to present them to Dr. Steinman in a special ceremony.

❁

Improved Teaching Urged By Commissioner Libby

Speaking at the dedication of the first university research reactor at North Carolina State College in Raleigh recently, Dr. Willard F. Libby, U. S. Atomic Energy Commissioner, scored poor teaching both in the high schools and in the colleges as one reason contributing to a shortage of engineers and scientists.

"The type of people who can successfully pursue a career in scientific and engineering fields have many doors open to them, and the competition in the freshmen and sophomore years in the colleges and universities for their interest is acute," he said. "We can understand, therefore, in part that uninspired

(Continued on page 8)

Whaddyamean...print tracer?

Running down who has what prints, where, for how long, and who is supposed to get them next... is a headache in any office. And waiting while prints are passed around to suppliers and contractors—holds up specifications and estimates, delays the job. Get an Ozalid machine!

With an Ozalid machine, you can have enough prints quickly, cheaply. An extra set can be made in a matter of minutes, for less than 1½¢ a square foot.

Ozalid saves draftsmen's time, too. Changes and additions can be made on Ozalid duplicate originals, without doing over basic drawings. And originals can be kept in the files.

You can also use Ozalid to copy reports, material lists, specifications, instruction sheets, letters, invoices—avoid manual copying and typing, cut clerical costs.

ANYTHING drawn, typed, printed or written on any translucent (lets light through) material can be copied by Ozalid. Lay the translucent original over a sheet of sensitized paper. Feed into any Ozalid machine—and in less than a minute, you get an exact copy, delivered dry, ready for use. No negatives, developing tanks, or dryers are required.

Ask the nearest Ozalid distributor *(see phone book)* for a demonstration. Or write 343 Ozaway, Johnson City, N. Y. In Canada, Hughes Owens Co., Ltd., Montreal.

OZALID—A Division of General Aniline & Film Corporation... *From Research to Reality*

OZALID

New STREAMLINER *400... prints on sheets or continuous roll stock up to 42" wide, as fast as 24' per minute... improved design, superlative performance, best value among lower priced whiteprint machines.*

"COSTS CUT 60¢ per hour per machine"

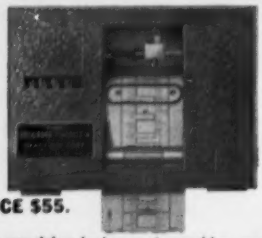
"... simplified our time study and cost analysis."

"... and, we will install your units on all our machines."

"... meets all our requirements. Ship 35 more units at once."

—just a few of the many comments we receive daily about...

TIME RECORDER-TOTALIZER



PRICE $55.

• This precision instrument provides accurate, permanent, chronological data about any machine, process or system in plant or office... on a continuous chart-roll which lasts four months. Uses no ink. Totalizer shows accumulated "on" time.

descriptive literature on request

RECORDER DIVISION—DEPT. E
HEAT-TIMER corporation
657 BROADWAY, NEW YORK 12, N.Y.

PUT CANCER ON THE DEFENSIVE

together we can strike back

Give to

AMERICAN CANCER SOCIETY

Briefs

(Continued from page 7)

teaching may have contributed to our present difficulties."

The Commissioner also singled out the inadequate salaries paid to high school teachers as another factor contributing to the problem.

"We must," he emphasized, "improve the teaching of science and mathematics in the high schools by providing more qualified teachers, better teaching aids, and consolidating schools to permit more courses, etc. We must improve at the high school level the identification, motivation and guidance of qualified students towards careers in science and engineering. Also, we must increase the number of qualified students who go to college, and encourage those with scientific and engineering aptitudes to pursue the courses in science and engineering. We must develop the necessary incentives to retain highly qualified scientists and engineers in colleges and universities. Finally, in addition, we should consider the improved utilization of scientists and engineers by providing additional technical personnel to relieve them of sub-professional assignments."

❁

R. E. Heartz Heads Canadian Engineers

R. E. Heartz, M.E.I.C., president of Shawinigan Engineering Company, Ltd. of Montreal, became president of The Engineering Institute of Canada during the organization's recent annual meeting in Toronto. He succeeded D. M. Stephens of Winnipeg, Manitoba, in the office.

During the meeting, one of the principal speakers, Dr. G. Edward Hall, president of the University of Western Ontario, pointed out that "There are not enough engineers to meet the increasing demand; there are far too few scientists to meet the needs of science, and too few doctors, nurses and clergy. There are not enough university graduates in the honors and professional courses to go around. But the picture can start to change in 1960 with the influx from our secondary schools—if we are ready for them."

Dr. Hall estimated that by that year the number of students seeking higher education in Canada will be twice the present number.

FIRE SIGNALING SYSTEMS

• Engineers, Designers, and Manufacturers of Electrical Systems for the Protection of Life and Property from Fire

See advertisements in Penna. Society Year Book, N. J. P. E., and N. Y. P. E.

ACME FIRE ALARM CO., INC.
C. W. Mitchell, P. E. *President*
106 Seventh Ave., New York 11, N. Y.

❁

Friel in Europe

Francis S. Friel, a well-known NSPE member and president of Albright & Friel, Inc., consulting engineers of Philadelphia, was an official delegate to the Fifth International Congress on Large Dams in Paris from May 23 to June 4. Mr. Friel represented the United States Committee on Large Dams, and also the American Society of Civil Engineers, the American Water Works Association, and the American Institute of Consulting Engineers. He is president of the latter organization.

❁

General Electric Plans Business Admin. School

Construction has recently begun in Crotonville, New York, on the buildings which will house the General Electric Management Research and Development Institute. A complete business administration college, owned by the General Electric Company, the Institute will have a permanent faculty, including a dean and a staff of a dozen or more professors and instructors. Intensive courses in advanced managerial techniques will be given at the school each year to approximately 300 selected G.E. executives, from section managers to vice presidents.

The Institute is being established in line with the increasing emphasis on management training in industry.

❁

Rensselaer Tech Reports Many Management Degrees

Rensselaer Polytechnic Institute, Troy, N. Y., awarded the greatest number of graduate degrees in Management Engineering in its history at the June commencement exercises, according to an announcement by the college.

The fact that fifteen full-time graduate students received the master's degree in the management major is one illustration of the increasing importance of this study and its recognition by industrial concerns, said Dr. Paul E. Hemke, vice president and Dean of Faculty at R.P.I.

During the past several years there has also been a spectacular upswing in interest in the subject among the students in the Evening and Extension Division. Graduate study toward a master's degree with a major in Management Engineering was inaugurated only two years ago, and R.P.I. reports there now are twenty-four degree candidates nearing completion of the two and one-half year part-time course, all of whom hold responsible positions in industrial concerns. One member of the group, who entered with advanced standing, will also receive his master's degree in June; the other twenty-three will graduate in January.

A similar course was begun last September with thirty-two men representing six industrial concerns, and a third management engineering program will start in September with at least twenty-five candidates for the degree.

❁

Sloan Research Fund

The establishment of a $5,000,000 fund to promote basic research in the physical sciences has been announced by the Alfred P. Sloan Foundation. It is being made possible by a special gift from Mr. and Mrs. Alfred P. Sloan, Jr.

The program, which the fund will sponsor, is expected to be in full operation by late 1956. According to the Foundation's announcement, it will first determine basic research areas with "extraordinary needs and an opportunity for fundamental advance," and then try to find scientists to meet those demands.

❁

More Metallurgists Needed

The American Society for Metals has recently pointed out that, in spite of the great demand in industry for metallurgical engineers, the 1955 graduates in this specialty represent a smaller number than last year. Only 492 degrees in metallurgical engineering were awarded this year in forty-nine institutions in the United States and Canada, as contrasted to the 549 degrees of last year, the society reported.

"Starting salaries in all engineering fields continue to give metallurgy top preference," a society statement pointed out. "An average of better than $400 monthly for metallurgical engineers indicates the high preference for specialists in this field. The number of engineering students selecting metallurgy as a career is, therefore, disappointing to both schools and industry."

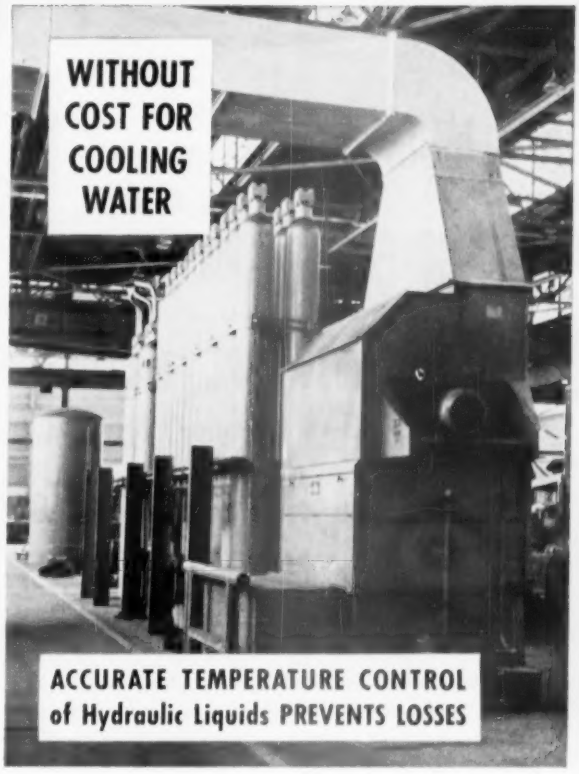
❁

C. R. Waters Ends Public Works Career

Charles R. Waters, district engineer for the New York State Department of Public Works at Buffalo for nearly thirty years and a member of the New York State SPE, has retired from his public works career effective July 1.

Recipient of numerous engineering achievement awards, including one from the local chapter of the NYSSPE, Mr. Waters expects to continue in the highway engineering and transportation fields and may open

(*Continued on page* 10)



● This NIAGARA AERO HEAT EXCHANGER cools the liquid for a large hydraulic press, preventing heat damage to the pump stuffing boxes. Using outdoor air as the evaporative cooling medium, it removes the heat at the rate of input (1,875,000 BTU/hr.) with no cooling water consumption except a negligible amount evaporated.

Air is free and cheaper to move than water. You can save much expense in pumping, piping and power, and quickly recover the equipment cost from the water saving.

Similar Niagara machines cool water, oils, solutions, lubricants and coolants for many mechanical, electrical and chemical processes. You can cool quench baths, welding machines, plastic molds, furnaces, controlled atmospheres, gases, compressed air either for power or instruments or processes. In a closed system, your coolant is never contaminated. The system is simple and easy to keep up; the equipment has a long, useful life. Select from a wide range of sizes up to 30,000,000 BTU.

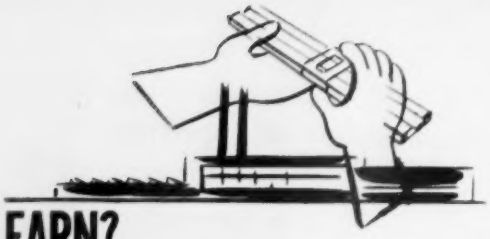
Write for Bulletin 120 to obtain a complete description.

NIAGARA BLOWER COMPANY

Dept. AE, 405 Lexington Ave., New York 17, N. Y.

District Engineers in Principal Cities of United States and Canada

HOW MUCH DO ENGINEERS EARN?



The Latest NSPE "Income And Salary Survey" Will Give You The Complete Story . . .

HERE IT IS . . . The most comprehensive and up-to-date information available from any source on the earnings of professional engineers during the past year. This newly published "Income and Salary Survey" was based on the information obtained from over 14,000 questionnaires returned from registered professional engineers. Nation-wide in scope, the survey covers engineers in industry, government, education, private practice, public utilities, and other categories. This carefully compiled study is based upon questionnaires machine-tabulated in the Bureau of Social Science Research of the American University in Washington, D. C.

Prices: Only 50¢ to NSPE members. $1.00 to non-members.

Here are a few of the survey topics:

- ★ *Geographic distribution*
- ★ *What kind of work did they do?*
- ★ *Earnings by years of experience*
- ★ *Earnings by field of employment*
- ★ *Employment status*

Mail This Coupon Today . . .

NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS
1121 Fifteenth Street, N.W., Washington 5, D. C.

Please send me ..... copies of the latest "Income and Salary Survey."

I am ..... am not ..... a member of NSPE.

I enclose (..... money order ..... check) in the amount of $.....

NAME .....

STREET .....

CITY ..... STATE .....

Briefs

(*Continued from page 9*)

an office for professional practice. He is a graduate of Union College, Schenectady, from which he also received an honorary Doctor of Engineering degree in 1952.

❁

Jelley Heads SAME

Rear Admiral Joseph F. Jelley, Jr., former chief of the Bureau of Yards and Docks and presently in charge of Navy construction in the Western Pacific, was installed recently as president of the Society of American Military Engineers, during the group's thirty-fifth annual meeting in New York City. Admiral Jelley succeeds Major Lenox R. Lohr, president of the Museum of Science & Industry, Chicago, in the presidential post.

At the same time, Major General James B. Newman, USAF (ret.), was installed as first vice president. Regional vice presidents for the current term are: John A. Reilly, vice president, Arundel Corporation, New York City—Eastern Region; Burton J. Bell, Corps of Engineers, Atlanta—Southeastern Region; Col. John C. Carruth, USA (ret.), San Antonio—Southwestern Region; Daniel A. Sullivan, Commonwealth Edison Company, Chicago—Middle Western Region; and Brigadier General Dwight F. Johns, USA (ret.), San Francisco—Western Region.

❁

Husband-Wife Team

A unique professional team is at work for the consulting firm of L. W. Veigel in Dickinson, North Dakota. Not only does the firm include Louis Veigel, an architectural engineering graduate of the University of North Dakota and now president of the North Dakota Society of Professional Engineers; but it also relies heavily on the talents of Mrs. Veigel, the former Mary Ellen Kelley of Fargo, who holds a degree in architecture from North Dakota Agricultural College.

❁

Lamme Medalist Named

A. M. deBellis, assistant electrical engineer, Consolidated Edison Company, New York, was named the recipient of the 1954 Lamme Gold Medal. The award, which is bestowed by the American Institute of Electrical Engineers, was presented to Mr. deBellis during the Institute's Summer General Meeting held at Swampscott, Massachusetts, June 27-July 1.

American Engineer

The Magazine of the Registered Professional Engineer

VOLUME TWENTY-FIVE NUMBER SEVEN

Year Ahead Presents Challenge, Responsibility

By

ALLISON C. NEFF, P. E.,

President, National Society of Professional Engineers

IN ADDITION to being a high honor, election to the presidency of a national professional organization brings with it both responsibility and challenge. In assuming leadership of the National Society of Professional Engineers, I personally feel keenly both the responsibility to carry on the excellent work and the well-defined programs of our retiring officers and the challenge to seek out new avenues of professional activity. It is only by assuming the responsibility and accepting the challenge that those of us who will direct the 1955-56 administration of the Society, with the help and support of the membership at large, will be able to make our full contribution to the fine record so far set in the professional field by NSPE and to augment and strengthen the foundation from which future professional activities will arise.

The organization, objectives, and philosophy of the National Society of Professional Engineers are sound and have been proven by the experience of twenty years. I have complete confidence in our three-level organizational structure because, having served in various capacities at all three levels—chapter, state, and national, I have had personal experience with its efficient functioning. We have a "chain of command," so to speak that arises from and goes back to the grass roots, making ours a truly democratic and eminently effective Society.

Also, the concurrent membership in three component organizations, made possible through this arrangement, provides unequalled possibilities for the professional growth of the individual, while progressive advancement through various levels of official duties also maintains a high degree of interest. Thus, there are a multiplicity of opportunities to serve the profession and the public and to share in the administration of the component parts of this three-level Society. It is unique in the engineering world.

Another organizational innovation which has just been made in the Society and which will undoubtedly serve to enhance the value and immediacy of our service to the membership, is the adoption of Past President Clarence T. Shoch's suggestion for the grouping of NSPE committees of kindred interests under group leaders who are vice presidents of the Society. This well thought out plan should stimulate and coordinate the work of the committees more effectively than ever before, and we are indeed indebted to Mr. Shoch for its development.

This, however, is only one of many exceptional contributions our immediate past president has made to NSPE during his administration. His year of sound leadership has resulted in the pinpointing of many other great professional goals. As he outlined them in his "State of the Society" speech at our Philadelphia meeting, we all were made aware that he has indeed charted the way to a long range program of constructive activities which will motivate our efforts for years to come.

In line with its announced purpose to promote and protect the profession of engineering "as a social and an economic influence vital to the affairs of men and of the United States," the Society will be moving forward determinedly in many areas during the coming year.

WE will be redoubling our efforts to improve em-

President Neff, left, speaks with Past President Clarence T. Shoch, center, and Executive Director Paul H. Robbins, during a recent meeting.

NSPE Officers, 1955-56

Louis F. Frazza
Vice President
Northeastern Area

R. J. Rhinehart
Vice President
Southwestern Area

Warner Howe
Vice President
Southeastern Area

Virgil E. Gunlock
Vice President
Central Area

Garvin H. Dyer
Vice President
North Central Area

Lindley R. Durkee
Vice President
Western Area

Paul H. Robbins
Secretary

Russell B. Allen
Treasurer

ployer-employee relationships in the engineering realm. To facilitate this, the Employment Practices Committee will now include four subcommittees: Engineers in Industry, Engineers in Government, Engineers in Education, and Engineers in Private Practice. Through this new diversification, the problems of all classes of employed engineers can be given more direct and specialized attention.

Furthermore, in dealing with the problems of the engineer in industry, an evaluation of suggested research subjects will be completed with a view toward supplementing the four Executive Research Surveys already compiled and published by the Professional Engineers Conference Board for Industry in cooperation with NSPE.

The integration of the recent graduate into the engineering world is a most important matter, both for the young man himself and for the future of the profession. We expect to give increasing attention to this question, to take every opportunity to inculcate the spirit of professionalism in our younger men, and to promote the ideal of attaining professional registration. In a parallel endeavor, we shall continue to urge higher standards of pre-professional education so that more of our young people will be both encouraged and prepared to take up the formal study of engineering and go on to successful and vital careers in the field.

Our publication program, through which we present the face of the Society to both members and nonmembers, will be carried forward with continued vigor. As one indication of the advances we are making in this regard, the AMERICAN ENGINEER, starting with the current issue, will have eight additional pages through which the NSPE story and many important professional opinions and developments may be presented. Individual publications will be prepared as necessary. And the *Chapter Activities Guides*—the new series of pamphlets which feature useful programs developed at the chapter level—will continue to be distributed for the guidance of our local affiliates throughout the country.

The impact of Federal legislation on the profession will continue under the close scrutiny of the experts in our Washington office. As in the past, the Society will be prepared to take prompt action to support or oppose bills affecting the interests of professional engineers, and prompt, up-to-the-minute reports will be available both in the pages of the AMERICAN ENGINEER and in the *Legislative Bulletin*.

ONCE again we are looking forward to the successful observance of National Engineers' Week in cooperation with many other organizations, with industry, and with civic officials. Because of the widespread interest evinced by many more industries than ever before during the 1955 celebration, plans are already being developed to increase the Week's potential for industrial participation.

We shall likewise take part in joint endeavors with other professions and other societies wherever we find a mutuality of interest. Good interprofessional and intersociety relations are an essential part of the service function through which every professional group endeavors to serve its membership.

There is, however, one facet of the society picture that has given me some concern lately, and that is the problem of the "high cost of belonging." A number of young men in the profession have told me that the cost of dues prevents them from joining all of the societies in which they are interested. For this reason it seems to me that there is a heavy responsibility on all of us who are leaders of engineering societies to see that we do not wastefully duplicate each others' efforts. Thus NSPE has always traditionally refrained from entering into technical fields and has concentrated on the professional problems of its members, thereby giving maximum service at minimum cost. This is a good policy and one that we ought to keep always in mind as we work through our various organizations.

This administration of your Society also expects to see the completion of the new NSPE headquarters building in the Nation's capital. Construction is moving ahead

(Continued on page 49)

Here are the members of the afternoon panel who answered questions from the audience. In the usual order are: N. W. Dougherty, dean of engineering, U. of Tenn.; E. L. Yates, GM executive; NSPE Pres. C. T. Shoch; John D. Coleman, chairman, Professional Engineers Conference Board for Industry; D. S. Roberts, GE executive; Dr. G. Brooks Earnest, chairman, Committee on Employment Conditions, EJC; C. A. Frische, Sperry Gyroscope executive; and R. A. Blackburn, chairman, Engineer-in-Industry Committee, NSPE.

Over 350 from Industry, Schools, Gov't. Attend NSPE Conference

ENGINEERS in industry may face complex problems of professional development, but representatives of both executive management and the profession are buckling down to an intelligent solution of these problems.

This was the impression generated by leading engineering figures at the day-long conference held in Philadelphia June 2 as a featured event on the program of the NSPE annual meeting.

The conference, formally entitled "Professional Development—The Responsibility of Industry and the Engineer," was attended by more than 350 NSPE members and guests.

The conferees heard an all-day session of prepared talks, panel discussions, and the answering of written questions submitted from the audience.

The general "theme" of the conference centered around the problems brought out in the recently published "A Professional Look at the Engineer in Industry," prepared by the NSPE Engineer-in-Industry Committee. In their talks, the speakers ranged from an analysis of some aspects of engineering education to the general problem of unionism for professional engineers.

In proposing solutions to the latter problem, the conference participants seemed to agree that engineers in industry are going to have to think and act like professional people if they are to live up to their responsibilities in an era of increasing technological complexity.

The over-all purpose of the affair was expressed by Clarence T. Shoch, retiring NSPE president, in his opening remarks at the morning session:

"By this conference, which is to explore the working relationships largely of the philosophical development with respect to professional engineering, we hope to conduct a further searching analysis of the factors governing the relationships between employers of engineers and those engineers employed in industry, a frank appraisal of their importance, some suggestions for specific improvements in these relationships, and over all, a measurable contribution to a better understanding between those employed and the employers."

From Gerry E. Morse, vice-president, industrial relations, Minneapolis-Honeywell Regulator Company, the conferees heard that industry has found engineers to be "confused, dissatisfied, and at odds with one another."

Mr. Morse declared emphatically that engineers who want the status and pay of professionals must "act like professionals and accept professional responsibilities."

"The professional is in a sense impersonal, almost selfless in the practice of his profession. Not all employed engineers have as yet firmly and convincingly demonstrated their acceptance of this view of professional responsibility."

Mr. Morse cited a number of studies which indicated that personal and social competence are highly important in an engineer's ability to succeed. He expressed alarm concerning his discovery that some engineers are not aware of codes of ethics for engineering.

"Some say they know there is such a thing but they never saw it or read it. Others say they read it once but haven't a too clear idea what it says. If an engineer pretends to be a full-fledged member of his profession, it seems to me that we in industry have a right to expect that he knows, is aware, upholds and operates in accordance with the canons of ethics or the statement of ethics or the code of ethics under whose banner he is traveling."

Mr. Morse added that "industry's willingness to rely on his judgments—often to stake a whole course of action on them, including investment, the employment of personnel, the advertising of the product, the sales effort—rests on one thing above all else: our confidence in him as a professional."

In his concluding remarks, Mr. Morse stated that he saw "in the NSPE and in the program for stronger and more meaningful registration laws a logical, practical

means to increase the professional stature ofengineering."

The role of engineering education in engineer-industry cooperation was discussed by N. W. Dougherty, dean of engineering at the University of Tennessee, and president of the American Society for Engineering Education.

DEAN DOUGHERTY summed up the task of the engineering schools as:

"The colleges must produce a beginning engineer who will grow into ripe maturity and take his place in research, design, operations, and management. His thought process must be individual and one which will go straight, and his decisions must be his own."

"The partnership between industry and education," Dean Dougherty said, "is to finally build an individual who is an independent arm of management." The Dean recommended that "education must assume more responsibility than it has been willing to assume in the last number of decades, because it must help the youngster to understand that when he goes out, promotion stops due to personal qualities long before it stops due to technical ability."

Dean Dougherty further advised that "we must place a high value on our freedoms and we must teach the youth that freedom is too high a price to sell for security, too high a price to sell for small monetary gains, and too high a price to sell for restraint in action."

"I am convinced that you can never have scientific development, that you can never have research development, unless you have freedom of the individual, freedom to think wherever the facts lead," he said.

"How can people have freedom of thought and action if they must be controlled by any type of group? I say that engineers dare not be subservient to management. They cannot be subservient to labor. They cannot be subservient to government. They have got to be free and independent to act as they think they should act; otherwise they are not engineers, and are not professionals, and are not doing the things which their high calling has caused them to be."

"Industry's Responsibilities to Its Engineers" was the title of a conference address given by Carl A. Frische, vice-president for operations, Sperry Gyroscope Company.

MR. FRISCHE pointed out that engineering management's responsibility includes making certain that engineers understand what is expected of them, reviewing progress at regular intervals, making the engineer feel that his work is worthwhile and is being recognized, creating a feeling on the part of the engineer that he is being treated fairly in comparison with other engineers, and helping to bring about public interchanges of general scientific and technical information.

The idea of unionism for professional engineers has added problems in engineer-management relations, the Sperry official said. "It is my belief that these union objectives, which occupy a prominent place in the traditional trade unionism that has developed among production, maintenance and craft employees, have no place among professional engineers and serve only to divert attention from the principal purpose of achieving constantly improving engineering goals," he said.

"It seems plain to me that professional engineers should no more be forced to join than to refrain from joining unions. Their choice should be unfettered and free of compulsion whether by union or management."

"Nor do I believe that the rewards in the professional career of an engineer should be the automatic consequence of time spent on the job. The wide area of an engineer's intellectual activity, the room for the play of his initiative and resourcefulness, make it essential that consideration of present skill and future promise, and not the automatic rule of seniority, should govern the advancement and pay of a man trained in the special competence of a professional engineer."

Mr. Frische described a merit review system for engineers that is subjected to joint administration as something that becomes "a medium for perpetual haggle and bargain rather than a means for objective appraisal of growth and ability."

He said it was necessary to answer "clearly, directly and openly any misrepresentation or distortion of fact, purpose or motive which some of today's engineering union leaders utilize to further their political ends."

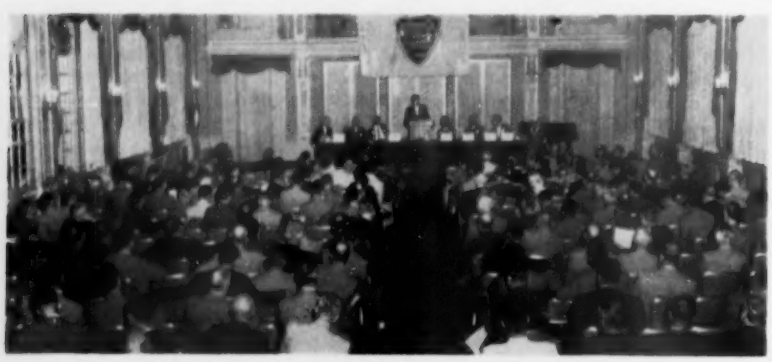
Industry's views regarding the young engineering graduate were described to the conferees by E. L. Yates, director of college and university relations, General Motors Corporation.

"It has been my observation based on a good many years' experience that engineering graduates have perhaps greater difficulty adjusting themselves to the business world than perhaps any other group of graduates."

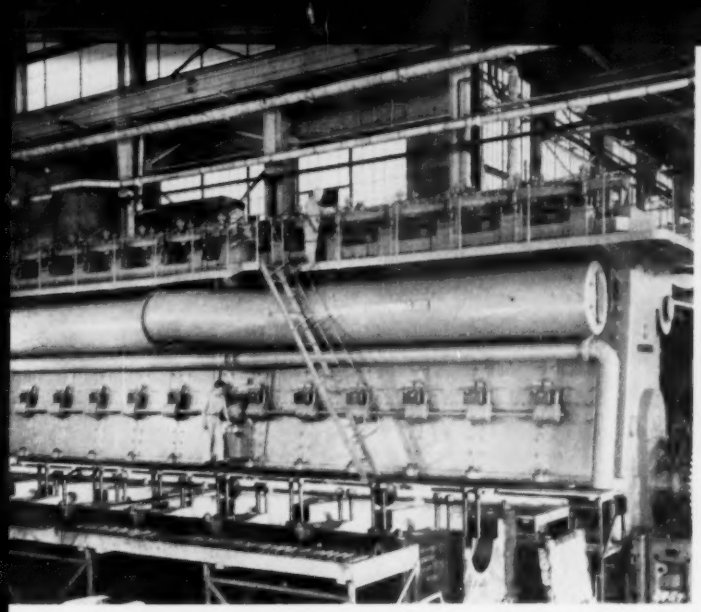
The GM executive recommended that engineering schools "stress much more strongly than many of them now do the points of view, attitudes, and organization and practices that prevail in the industrial world."

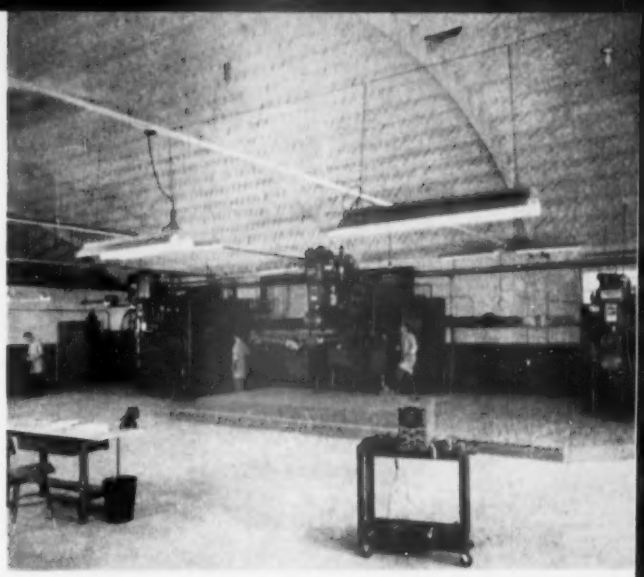
Mr. Yates emphasized that the schools should encourage their undergraduates to seek practical experience through summer employment. He also suggested that industry provide more opportunities for engineering educators to acquire "experience in industry or firsthand observation of its practices."

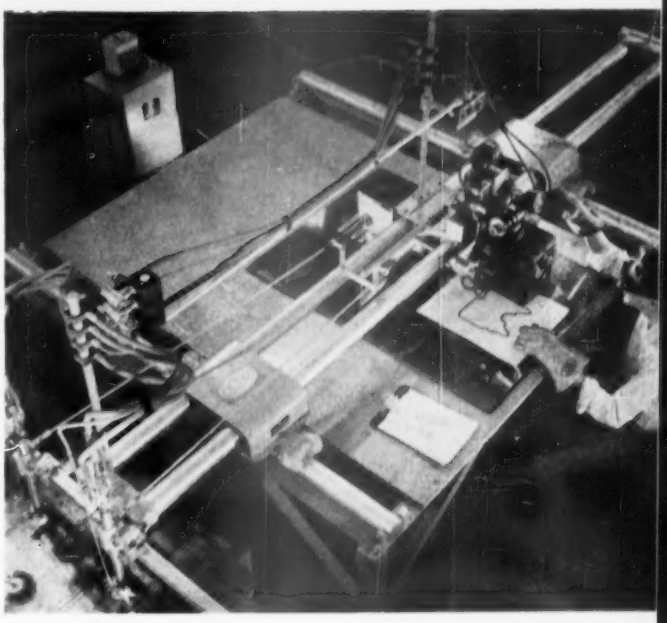
Commenting on what he termed excesses of "rushing" the young engineering graduates, Mr. Yates declared



Here is an over-all view of the more than 350 NSPE members and their guests who gathered in Philadelphia to hear experts discuss the problems of the professional engineer in industry.







The ubiquitous engineer in industry. Above he designs a 12-cylinder Diesel engine for the Norberg Manufacturing Co. Above, right, he carries on complicated tests at Sciaky Research, and, at right, his dreams swing into production as a technician goes to work at Air Reduction Co.

that "it is time this foolishness stopped, and recruiting treated as the serious business it is—helping the young graduate make one of the most important decisions of his life."

Mr. Yates emphasized that the problem of the recent college graduate in engineering was something that should be treated as one of the "foremost" problems involved in engineer-management relationships.

"Early frustrations usually deepen as time goes on, rather than disappear. If there are enough of them, then we are in for trouble in our relationships. Conversely, the right sort of start for the graduate leads usually to good personal professional development, to good down-the-road relationships, and to the sort of engineer corps we must have if we are to meet successfully the challenges ahead."

"As I see it, the problem we have to face today with respect to many college graduates has its roots in the following conditions:

"The graduate's lack of experience, lack of knowledge of industrial life and organization.
His misconceptions concerning the utility of a college diploma.
His belief that technical knowledge alone is sufficient to carry him to the top of his profession in industry.
His dissatisfaction with initial placement on a routine job, or the period he should spend in such a job.
His general point of view and attitude."

"Why do some young engineering graduates fail to progress much beyond the technician's level and the technician's salary? Seldom is this due to lack of either engineering knowledge or inherent capacity. In most instances, it is due to failure to take advantage of opportunities to develop their full capacities."

In discussing the role of the professional society in helping young engineers, Mr. Yates urged that graduates "should be encouraged, and given specific opportunities, to actively take part in the work of these societies as part of their development."

"NSPE's 'A Professional Look at the Engineer in Industry' is being widely read and discussed both in college and industry circles," he said.

Mr. Yates concluded by stating that 52.4 percent of the top management of the General Motors Corporation are engineer-trained.

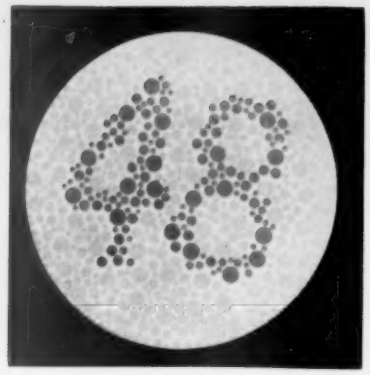
D. S. Roberts, a General Electric Company engineering executive, told his audience that the development and utilization of engineers was more important than ever before because of three principal factors:

1. **The many responsibilities industry has assumed along with its status as a "corporate citizen."**
2. **The scarcity of engineers.**
3. **The large number of engineering graduates being turned out by Russia.**

(Continued on page 15)

An Expert Reports on

Color Blindness and Engineering



By Israel Dvorine, O.D.,

Noted Author and Lecturer in Optometry

JUST as the nineteenth century gold prospector might still be looking if he hadn't been able to spot the yellow nuggets among the worthless minerals, so, too, the twentieth century "forty-niner" relies to a large extent on his color vision to pick out the most likely locations of pay dirt.

Although the modern day prospector is looking for uranium ores instead of gold and carries a Geiger counter rather than sifting pans, he must still be able to recognize minerals in rock outcrops by their difference in color. By knowing the kind of company the ores of uranium keep, the job of finding these ores is simplified considerably.

Normal color vision is a must not only in geological work but in all the aspects of technology. In what ways, then, does color blindness, which affects eight million men in the United States, bear upon the members of the engineering professions?

Working as he does in an environment of earth, water, sky and woods, good color vision is more than just an asset to the civil engineer, it is a necessity.

In order to distinguish one natural formation from another at a distance, the ability to differentiate between colors is often called upon as the only means of doing this. Defective color vision could easily affect the judgment and calculation of distances.

The ability to use and recognize color is of prime importance in surveying. When making topographic maps, the symbols for the features of the area being described must be drawn in different colors. The standard practice in making maps, according to a book on elementary surveying, is as follows:

"Black is used for lettering and the works of man, such as roads, railways, houses and other structures; burnt sienna (reddish brown) for all land forms., i.e., contours and hachures; prussian blue for water features, such as streams, lakes, marshes and ponds; and green for vegetables, including trees and grass."

When planning a foundation for a structure, the civil engineer must be able to recognize the different types of soil so that a foundation of suitable type and strength can be designed. The differences in color of the materials found in the ground are frequently very subtle and a keen color eye is needed to tell them apart.

A metallurgical engineer lacking normal color vision would be severely handicapped in his work. Even a slight error in judging color might result in the spoiling of several tons of costly metal.

In the operation of the Bessemer converter, in which pig iron is converted into a type of steel, streams of air are blown through the molten metal. While the blast is on, the oxygen in the air combines with the impurities in the metal, such as silicon and carbon, leaving nearly pure iron.

When the impurities have been burned out by the air blast, the color of the flame issuing from the mouth of the converter changes. This is the signal for the engineer to turn off the air and add certain substances that are intended to harden the metal.

In heat treating metals, the temperature of the furnace is highly important. It is essential, in this process, that the metal be brought to a definite temperature before "quenching." Knowing that the color of the metal changes—from purple, to straw, to yellow, to cherry red, to orange, to white—as its temperature is increased, the metal's temperature can easily be determined.

THIS is done by means of the optical pyrometer. In using this instrument, the operator compares the color of the metal with a standard series of colors on a chart which has been correlated with temperature. Obviously, such comparisons could not be made by a color blind individual.

Even electrical and radio engineers depend heavily on good color vision. For simplicity and convenience, a series of color codes has been established to describe the many components of electronic circuits.

In the case of resistors and capacitors, 13 different colors are used to indicate the significant figure, the decimal multiplier, the tolerance, and voltage rating (for capacitors only). The location of the colors, in a set of bands in the resistor and a group of dots in the capacitor, tells which of the above four pieces of information is being given and its value. What should be known about these devices, thus, is given by four colors. It would indeed be very difficult to assemble a circuit according to specifications without being able to see the different colors. Color codes have also been adopted for each component of power transformers, audio transformers, and intermediate frequency transformers.

The progress of a chemical reaction is often followed by noting the color changes which occur. A chemical engineer concerned with the control of some organic synthetic process is frequently required to tap off samples and make a rough estimate of the stage of the reaction. Although instruments are available that can make determinations with a very high degree of accuracy, the engineer is, nevertheless, called upon to make judgments on the spot that can not wait for the completion

Often the engineer in research work must depend upon normal color vision for success.

of more elaborate procedures. Normal color vision, in this situation, is a very definite asset.

The nature of the combustion taking place when a gas mixture is burned can be gauged quickly by noting the color of the flame. In the combustion of mixtures of fuel gas and air, for example, a relative shortage of air in the mixture is immediately evidenced by the bright yellow flame with which it burns. Conversely, a mixture containing too large a proportion of air is characterized by its pale blue color which often approaches invisibility.

A color blind man in this situation might, in addition to wasting fuel, bring on a state of affairs in which an explosive mixture is allowed to develop because of his inability to recognize the color changes that herald the approaching danger.

What part does color play in mechanical engineering? In the power field, for example, the piping in the distribution systems carrying different media at different temperatures is painted in various colors for quick identification.

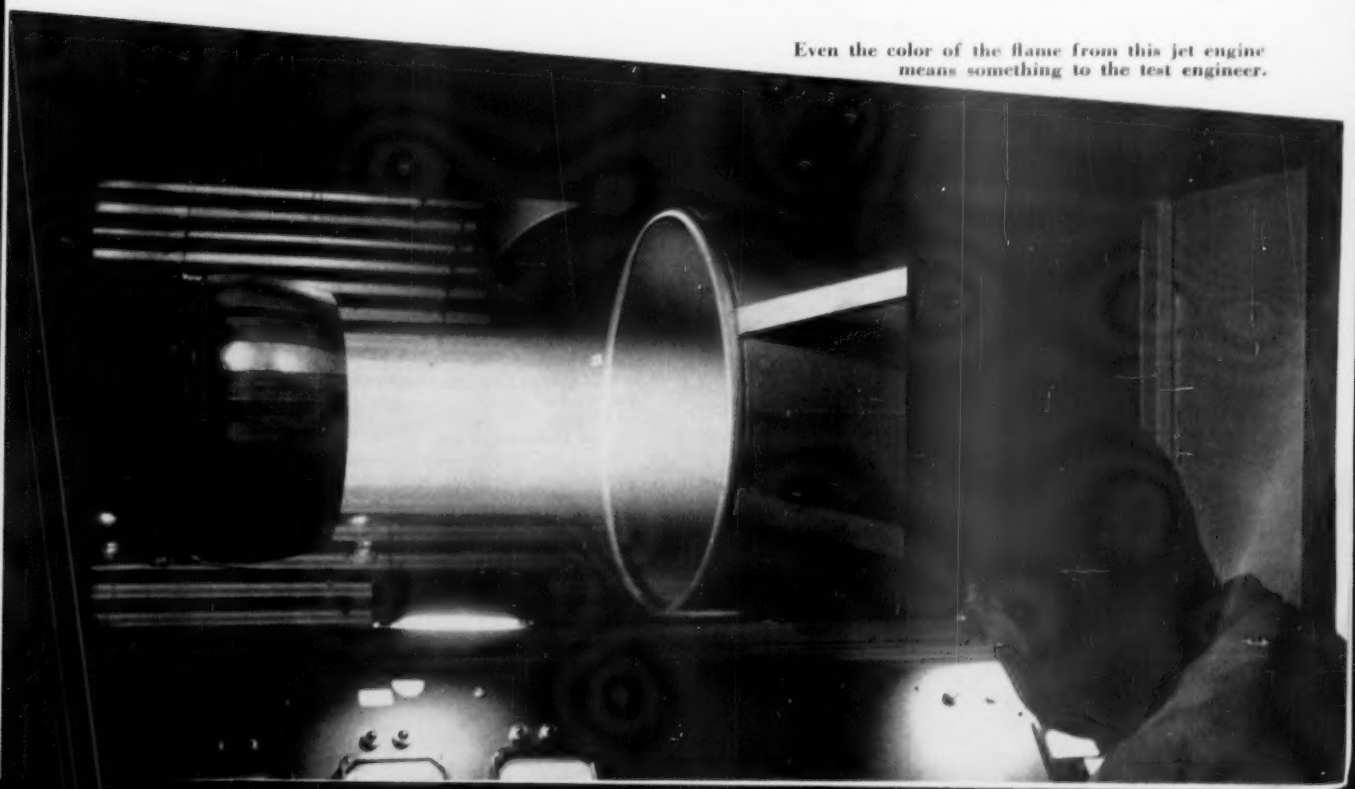
DEFINITE standards have been set up for the coloring of pipes; that is, blue pipe indicates cold water; yellow—hot water return lines; green—gas lines. An engineer told to supervise the getting of a "bug out of the hot water transmission line" would have a hard time finding it if he couldn't locate the particular pipe by its color.

The levers on machines are also painted different colors to designate their function. On instrument panels, white, green, red, and yellow flashing lights are used to indicate the processes going on at a particular time in the operation controlled by the panel. The role of color in these circumstances is quite clear.

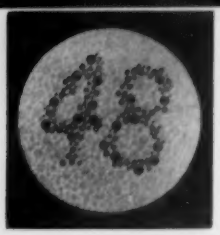
What, then, is color blindness and how does it differ from normal vision?

The average, or normal, observer can respond to all the frequencies of light comprising the visible spectrum. The color blind individual is one whose visual process is capable of only a limited response to chromatic stimulation and who is not stimulated by the various frequencies of the visible spectrum to the same extent, or in the same manner, as the normal observer.

The sensations of color produced by light, like all of its other properties, are functions primarily of its wave



Even the color of the flame from this jet engine means something to the test engineer.



The author believes that color blindness could be a great handicap to the engineer in the practice of his profession.

length (or frequency). The wave length of light, being quite short, is measured in millimicrons (mu). The wave lengths of light found in the visible spectrum range from 380 to 760 mu.

The difference between the color blind, or color weak, individual and the normal individual is that the latter responds to the entire visible spectrum while the former is insensitive to some or all of it. In other words, the visual perception of the color blind is such that the gradations of color from red to violet are not perceived. The spectrum of the color blind person is interrupted by one or more "neutral areas" in which he sees no color at all, only a band of gray. Or, he may see gradations of the same color where the average observer will see different colors. For example, what looks like a band of red color of different intensities to the normal viewer may appear as yellow or green to the color blind or color weak individual. His sensation will, of course, depend upon the nature and degree of the defect from which he suffers.

It is generally known that color blind people are not able to see red or green, that to them these colors appear as gray or black. In reality, however, color blindness causes confusions that are much more complex than the simple matter of mistaking reds and greens.

The color blind man may confuse blue with gray, blue with purple, red with green and brown, green with brown or orange, and most pale colors with one another. Gray may be confused with red and green, and red may be invisible or replaced by yellow, green or black.

FINALLY, there are among the color blind a few persons who exhibit total insensitivity to all colors and who, therefore, see nothing but black, gray, or white. In the terms of the photographer, such individuals see the world in "monochrome." Fortunately, this type of color blindness is extremely rare.

Although color blindness can not be prevented or cured, it can be detected by means of tests. The mere fact that this condition can be discovered is noteworthy, for this makes it possible for those affected to allow for the limitations imposed by this defect on their everyday activities. It is interesting to note that most color blind individuals are unaware of their defect until it is called to their attention.

A number of tests are available for the detection of color blindness. The one most frequently used is the type which consists of printed charts known as the Pseudo-Isochromatic Plates. These plates are imprinted with circular designs made up of multi-colored dots of various sizes. Within the circles certain dots are grouped to form a number which is readily perceived by individuals possessing normal color vision. To the color blind, however, the designs represent merely a mass of colored dots without shape or form.

Generally speaking, these tests may be divided into two classes. The first includes the simple screening tests that are designed to do nothing more than to distinguish the color blind from those with normal color vision.

The second class consists of those qualitative diagnostic tests which are designed not only to distinguish the color blind from the normal, but also to classify individuals according to their particular type of defective vision. The author's set of color plates belongs to this group.

The color blind are generally classified as protanopes and deuteranopes; the first is associated with abnormal appreciation of luminosity, the second with normal. With the use of Pseudo-Isochromatic Plates one can simply and easily determine whether a person is color blind or not and, if his color vision is defective, the type of defect.

It can easily be seen that the engineer is intimately concerned with color. Young people contemplating a career in one of the engineering professions should first make certain that they have normal color vision. Defective color vision would be a great handicap not only in the actual practice of the profession but in preparing for it as well.

Those in the profession who lack normal color vision should be made aware of this fact through tests so that they may, then, exercise greater care in the judgment of colors. Only by bringing the matter of color blindness to their higher levels of consciousness will color blind individuals pay more attention to details and avoid the gross, unwitting errors that inevitably result.—***End.***

About the Author . . .

Dr. Dvorine

Dr. Israel Dvorine has been practicing as an optometrist in Baltimore, Maryland, for more than thirty years. He received his professional training in a private school in Baltimore, passing the Maryland State Board examination in 1922. He has also studied at the Philadelphia Optical College and the Pennsylvania College of Optometry.

He is the author of a number of technical publications on vision, including a textbook, *Analytical Refraction and Orthoptics*. He has also given numerous lectures in the field of optometry.

He is a member of the American Optometric Association, a fellow of the American Academy of Optometry, and a member of the American Association for the Advancement of Science. He has also served three terms as president of the Maryland Optometric Association.

NSPE Salary Survey Now Off the Press

There has been a general upswing in the income of registered professional engineers in all branches in the past several years, with the greatest increase apparent in the field of chemical engineering. This is one of the general conclusions drawn from the data included in the new *Professional Engineers' Income and Salary Survey* just published by the National Society of Professional Engineers. *(See page 10.)*

The report, the second in the long-range NSPE salary study program, is based on the 1954 calendar year income of the P.E.'s and represents the response of 43 per cent of the Society membership to the salary survey questionnaire. The story is told in charts, tables, and interpretive text. Wherever possible broad general comparisons are made to the statistics from the first NSPE salary survey, published two years ago, which covered the 1952 income of the engineers. Since the same respondents are not necessarily represented in both surveys, however, and for various other reasons, the comparative data are presented only as an indication of trends in the income status of NSPE members, rather than as absolute and precise measures of change.

By and large, the engineers surveyed represent an experienced group, with about half having twenty years or more of work in the engineering field to their credit. The majority of respondents were found in the Middle Atlantic, Middle Western, and New England States, and again private industry was found to be the principal employer of those surveyed. Four out of five in the study were employees working in salaried positions, while one-fifth were self-employed. About half of the self-employed had private engineering practices, and the remainder were construction contractors and owners of industrial or commercial enterprises.

Ninety per cent of the engineers earned at least $5,570 in 1954; 75 per cent earned at least $6,690; 50 per cent earned at least $8,460; 25 per cent earned at least $11,700; and 10 per cent earned at least $18,210. Earnings--and the increase in earnings since 1952—varied considerably according to years of experience, branch of engineering, employment status and field of employment, type of work performed, level of responsibility and skill, and region of employment. All these variations are graphically depicted in the charts and tables printed with the report.

In considering the median incomes, it was found that the highest were in private practice, construction, and industry. The incomes of engineers working for government agencies were lower than those for any other group; this again is a factor in the low median for civil engineers when incomes are considered according to branch of activity.

As in 1952, engineers in executive-administrative positions and those working in the sales field earned a good deal more than those in other activities. Research and development men were also among those earning more than $10,000 in the upper quartile; their median salary was reported as $7,960.

Least well paid according to type of work performed were those doing production and design work and those in construction supervision, but this is partially explained by the fact that such jobs are most frequently held by younger men just beginning their engineering careers.

The survey report also covers earnings by grade and region and many other details with supporting statistics and appropriate analysis of the data. Copies of the complete report are available from NSPE national headquarters at 50 cents per copy to NSPE members and $1.00 per copy to non-members.

This ad . . .

Business Opportunities

Opportunity in Colorado for capable engineer to secure interest paying $15,000 and over in Mechanical Electrical Civil Consulting firm. Ability and reputation more important than financing. Owner's heart and health bad. Box 902-B, AMERICAN ENGINEER.

. . . drew 26 replies

Business Opportunities ads are your Business Opportunities

. . . to get into business
. . . to sell your business
. . . to get a partner

AMERICAN ENGINEER
CLASSIFIED ADS
Reach over 36,000 RPE's

Engineering Positions Are Open Overseas

It has recently been announced that civilian positions with the United States Air Force overseas are open for civil engineers (options: pavements, sanitary) and mechanical engineers (heat, ventilation, refrigeration, air-conditioning maintenance and repair, and utilities).

Interested applicants may apply by submitting resumés or Standard Form 57 to Headquarters, USAF, Directorate of Civilian Personnel, Overseas Employment Branch, Attention, AFPCP-D-3.

Bridge Clearance Is Subject of New Book

Navigational Clearance Requirements for Highway and Railroad Bridges is the title and subject of a new book prepared by the U. S. Department of Commerce in the office of the Under Secretary for Transportation.

Of interest to all engineers in the transportation industry and in municipal work, the 158-page book traces the history of the navigational clearance problem, is replete with charts, statistics, and other data, and offers valuable suggestions for money-saving steps in bridge construction.

Nine different Federal agencies and more than forty state highway departments and sixty railroads contributed information for the report. Copies are available from the U. S. Department of Commerce, Room 6225 Commerce Building, Washington 25, D. C., at $1.50 per copy.

Potter Receives Award . . .

Full Professional, Social Program at Phila. Meeting

THE Twenty-First Annual Meeting of the National Society of Professional Engineers in Philadelphia, June 2-4, marked another high point in the Society's history. Held in conjunction with the annual meeting of the Pennsylvania Society of Professional Engineers, the event drew a considerable number of engineers from Pennsylvania and throughout the country as well.

One of the major attractions was the day-long conference, June 2, on "Professional Development—The Responsibility of Industry and the Engineer," which is reported in full elsewhere in this issue. The second day of the meeting was taken up with professional business, and was also marked by a Delaware Port cruise arranged by the Philadelphia Chapter for the visiting engineers and their wives. Highlights of the concluding day, in addition to the regular professional and business sessions of both the PSPE and NSPE, were the luncheon at which the Pennsylvania Registration Board members were honored guests and the joint annual banquet in the evening.

The luncheon was also the occasion for the presentation of a special award by the Pennsylvania Society to Walter E. Witte in recognition of his long years of service as treasurer. During the annual banquet, the NSPE Award for 1955 was presented to Dr. A. A. Potter, dean emeritus of engineering at Purdue University, and the new NSPE officers were introduced and installed.

Outgoing President Clarence T. Shoch presided over the professional sessions and presented a comprehensive report on the state of the Society. His discussion covered such topics as: spheres of professional interest, engineers and defense needs, engineering education and pre-professional education, professional development, professional practice, inter-society and interprofessional relationships, Society services, and organizational arrangements.

"I would," he said, "describe this as a year of consolidations, of steady progress toward established goals. More and more, our work is reaching into the stages of unexplored, higher considerations. This, together with the strides expected of the engineering profession in the next few years, will indeed tax our resourcefulness. . . . Much good work lies ahead for willing hands. The satisfactions of an honorable calling are at stake. As we have been so well admonished, may we exercise voluntary effort, strive for excellence, give unrequited service to the common good, and seek to invest our work with a wide and enduring significance."

PSPE President Robert F. Miller presided at the Pennsylvania Society's annual meeting sessions. Merrill Blankin of the Philadelphia Chapter served as general chairman of the joint meeting, assisted by Alfred Baccini and Victor Thomassen as vice chairmen.

Dr. A. A. Potter, right, dean emeritus of engineering at Purdue University, receives the 1955 NSPE Award from Past President Clarence T. Shoch.

Other committee chairmen were: Harry Erickson, banquet; R. H. Merz, entertainment; A. H. Kidder, sessions; George Cook, Jr., finance; Stanley Paist, publicity; Howard Sheppard, exhibits; J. M. Borden, hospitality and reception; Ralph Earle, hotels; George Kelso, transportation; and P. J. Goldman, inspection trips. Mrs. Merrill Blankin headed the committee that arranged a special program for the ladies.

The Annual Meeting was preceded by a day-long meeting of the NSPE Executive Committee at which various reports of Society activities were reviewed and studied.

Highlights of the professional action taken during the meeting itself and of reports received from the various NSPE committees are as follows:

Awards—Pres. Clarence T. Shoch, P. E., reporting.

Recommendations for Board action:

1. That the Bylaws be amended to provide for a standing committee to be designated as THE N.S.P.E. AWARD COMMITTEE which shall have as its sole function the selection of an individual to receive that award at the Annual Meeting.
2. That no other award be made by N.S.P.E. at the national level.
3. That the special committee be discharged.

Discussion of recommendations:

1. Appointments to the Awards Committee have been made in the same manner as those to standing committees. The committee has functioned generally as if it were a standing committee. The award has become recognized as one of the

Head tables at the annual banquet are shown. Distinguished members and guests are gathered with NSPE Past President and Mrs. Clarence T. Shoch who are seated at the table in the foreground behind microphone.

main features of the annual meeting. The selection of the recipient has been the principal business of the committee, but since its duties were not clearly defined it has had referred to it many suggestions related to the broad subject of awards which might more advantageously have been acted upon by the Executive Committee.

2. Several of those suggestions, if acted upon favorably, would lead to a proliferation of awards which would detract from the stature of the N.S.P.E. Award and hence would tend to defeat one of the purposes in mind when it was established, namely, bringing N.S.P.E. favorably to the notice of the engineering profession and of the public. There is ample opportunity for the state societies and the chapters to make such awards of their own as they may deem appropriate in supplement of the national award.

3. This naturally follows if the Board acts favorably on the first recommendation.

Board Action: Report received.

Chapter Activities—D. C. Peters, P. E., reporting. Recommended for Board action:

1. It is recommended that this Committee be authorized to continue with the program of publication and distribution of chapter monographs to stimulate chapter activity and programs.

2. That the Board accept the recommendation to standardize the change in State and Chapter Officers before the summer lull, so as to afford an opportunity to organize for effective action during this slack period.

On the premise that the Society's advancement depends in large part upon effective action by Chapter Committees the Chapter Activities Committee explored active means to stimulate Chapter officers and Committees and to provide *currently*, constructive ideas, methods, programs, and advice, for Chapter use at reasonable cost to NSPE.

It was observed that new Chapter officers require a varying, but usually considerable length of time to acclimate themselves to their jobs no matter what their length of service in the Society; and that one of the major weaknesses in Chapter Committee work has been the lengthy period required to formulate a program, often leaving insufficient time during a term of office to activate and obtain results.

As outlined in our previous report the Committee has prepared and issued to all Chapter Presidents a copy of—"Welcome, Mr. President." This booklet is designed to be an inspirational introduction to the myriad duties and responsibilities that a Chapter President faces and should be sent in the future to each Chapter President immediately on his election to be most effective.

It was also observed that the programs and activities of the various NSPE committees were not filtering down to Chapter Committees in usable form. The problem was determined to be one of effective communications and organization for effective action.

It was felt that effective communications could be improved by the distribution to every chapter committee of short monographs, colorfully illustrated, outlining in concise terms suggested Committee activities and programs.

Accordingly, three monographs have been published and distributed.

1. "Helping the Young Engineer." This monograph was designed to provide each Chapter Young Engineers Committee with a specific program of things that can be done to stimulate the young engineer's interest in our Society and to aid him in his professional development. The monograph can also be used to provide tangible proof to the young engineer of the Society's efforts in his behalf and thereby sell him on the Society.

2. "NSPE Ladies' Auxiliaries." This monograph outlines some of the things that a Ladies' Auxiliary may do to help a Chapter.

3. "Ethical Practices." This monograph suggests many specific activities the local Chapter may engage in to promote higher standards in the practice of engineering.

The Committee has planned and is in the process of producing additional monographs on:

1. Meeting Attendance and Fellowship.
2. Legislative Committee Activities.
3. Chapter Publications.
4. Functional Group Activities—as practiced by the Ohio Society.
5. Inter-professional Relations.
6. Membership.

The Committee recommends that the following Committee continue this work.

While we are providing the tools for effective communications we are not organized for effective action. We must systematically indoctrinate and stimulate Chapter officers and Chapter committees. The Committee proposes a monograph on "Organization for Effective Action," outlining the successful methods of the large service clubs adapted to our situation.

It is becoming increasingly apparent that a change in State and Chapter Officers before the summer lull gives the new officers the entire summer to organize for a continuous nine or ten months of activity through the winter.

The Committee recommends the acceptance by the Board of the procedures outlined in the monograph and the acceptance of the recommendation to standardize the change in State and Chapter Officers as outlined.

With reference to the Ladies' Auxiliaries the National Society office has compiled a list of them which has been printed in Vol. 2 of "Engineers' Wives," edited by Mrs. Edith E. Hendrick, Chairman of the Ladies' Auxiliary Advisory Committee.

The National Society has seen fit during this year to authorize a small budget to provide some assistance to the Ladies' Auxiliary for printing and limited staff assistance, etc.

The Ladies' Auxiliary movement has continued to grow during the past year and has rendered invaluable assistance to the Society in furthering the aims of the Society.

Board Action: Report approved.

Constitution and Bylaws—W. E. Christian, P. E., reporting.

Upon instructions from the Executive Committee, your Constitution and Bylaws Committee has studied suggestions for amending Bylaw 24, paragraph "d."

We are quite in agreement upon the conditions covering eligibility for "Waiver of Dues."

There is also very substantial sentiment, among Committee members, in favor of the use of the title "Life Member," for those fully qualified, under the proposed new requirements.

We submit, therefore, the following amendments which, if adopted, will replace paragraph "d" of Bylaw 24. It is the recommendation of this Committee that these amendments be approved.

Delete paragraph "d," Bylaw 24, and substitute therefor, the following:

Bylaw 24, paragraph d. A member shall become eligible to Life Membership and shall be designated a Life Member after meeting all of the following qualifications: 1. He shall have retired from the active practice of Professional Engineering; 2. He shall be at least 65 years of age; 3. He shall have been a Member of the Society, in good standing for an uninterrupted period of twenty years or more; 4. He shall file formal application, certifying compliance with all requirements for eligibility, through Chapter (if any) and State Society, to which Member belongs, both of which will formally certify to the National Society, concurrent approval and waiver of their respective dues.

Bylaw 24, paragraph e. After ten years of continuous membership, an application for waiver of dues because of disability of a total and permanent nature may be made by a Member in writing. Such application shall be subject to approval by Chapter (if any) and State Society of his membership, and final approval by the Executive Committee of the National Society.

Should the Board of Directors approve these proposed amendments, this Committee recommends this additional action by the Board: That a motion be passed providing that the Amendments be effective as of July 1, 1955, that they not be retroactive, and that all State Societies be so advised. The intent of such separate action is to avoid incorporating into the Bylaws, provisions of temporary utility.

Board Action: Report received.

ECPD-NSPE Joint Committee—Ray L. Sweigert, P. E., reporting.

This Committee does not have any specific recommendations that require action of the Board and the following report is presented for information only.

The Committee has been concerned with improved cooperation between ECPD and NSPE. This involved the possibility of NSPE becoming an affiliate of ECPD. A Joint Committee was established and an early report was presented to the Board at Omaha. The Board at that time gave the green light to proceed.

At Cincinnati the Joint Committee prepared a report to be presented to the ECPD Council. The ECPD Council approved the report which included recommendation that NSPE become one of the cooperating members of ECPD.

The ECPD Council then presented its action to the constituent members, three-fourths of which (6 out of 8) needed to approve the ECPD Council action to make it effective. In all the action taken up to the present, the NSPE group, while supporting the ECPD group, did not take the initiative. The most recent information at hand is that three societies have taken no action on the ECPD Council action on the basis that NSPE has not presented a proposal for membership in ECPD. Presumably they are awaiting such a proposal.

When information on the present status of the ECPD Council action is received, then we will need to decide what course of action to take. We will, of course, be guided by the suggestions received as a result of further considerations of the ECPD-NSPE Joint Committee.

Board Action: Report received.

Education—Ray L. Sweigert, P. E., reporting.

Recommended for Board action:

1. That [a new] vocational guidance leaflet be printed for distribution to high school students, teachers, counselors and parents.
2. NSPE take an active part in programs to improve the teaching of sciences and mathematics education in high schools.
3. NSPE should promote Science Fairs and Engineering Clubs at the local and State level.
4. That NSPE participate in State and White House Conference on Education.
5. Affiliation should be established between NSPE and AAAS.
6. Cooperative action should be established between State Societies and State Education Associations.
7. That NSPE go on record as favoring salaries of engineering faculty members comparable to those received by those teaching other learned professions such as medicine and law.

Board Action: Report received.

Engineer-In-Industry—R. A. Blackburn, P. E., reporting.

Recommendation—With the publication of "A Professional Look at the Engineer in Industry," and the completion of arrangements for the Conference at this meeting—PROFESSIONAL DEVELOPMENT—The Responsibility of Industry and the Engineer—we have concluded the *first phase* of our program to work for the betterment of the professional, economic and social status of engineers in industry.

We strongly recommend that the accomplishments to date be regarded as a first step in a long-range program and that the Board of Directors continue the moral and financial support which will be necessary for a sustained program. We take this occasion to remind the Board of the wording of the motion which was the basis of the formation of this Special Committee: ". . . that a special committee of NSPE be directed to consider the problems of engineers in industry and methods whereby NSPE could better serve their needs and desires." We feel that a start has been made in meeting this standard and we sincerely hope that with the support of the Board further substantial progress will be made by the Committee of the future in serving the interests of those professional engineers who comprise the largest functional bloc in the engineering profession.

Facts about the distribution and sale of the book:

The first printed copies of the publication, "A Professional Look at the Engineer in Industry," were received the last day of the Charlotte meeting, February 19, 1955. Since that time the following developments have occurred:

1. Complimentary copies were sent to: Board of Directors, Executive Committee, State Presidents, State Secretaries, Chapter Presidents, Chapter Secretaries, Committee Chairmen, Professional Engineers Conference Board for Industry, Deans of Engineering, Engineering Associations and Societies, Government Officials.

2. A comprehensive press release was sent to newspapers and magazines, and the major engineering publications also received a review copy. As of April 29, 1955 the book has been reviewed in: *New York Times, Daily Labor Report, Engineering News-Record, Industrial Relations News, Plant Engineering, Industrial Laboratories, Chemical & Engineering News, Southern Pulp and Paper Manufacturer, Electrical Engineering, Constructioneer, Machine Design, Construction Record.* A number of other publications have stated that they will review the book.

3. Approximately 1500 copies were distributed on a complimentary or review basis. As of May 15, 1955, 2,600 copies of the book were sold, representing a gross income of approximately $4,100 (which more than repays the production cost of the book).

4. Several deans of engineering have written that they plan to use the book as basic text material for courses in professional relations and industrial relations aspects of an engineering career. This development suggests the possibility of further consideration of supplementary programs directed toward engineering students.

5. A number of NSPE Chapters have used the book as the basis for a Chapter meeting, assigning a qualified member to review it and then following with a floor discussion of the various points from the membership. Such programs are highly desirable and helpful and should be encouraged.

6. Reduced prices for bulk orders have been established. A substantial number of companies have purchased under the bulk order arrangement, ranging from 25 to 250 copies. Also, many Chapters and State Societies have submitted bulk orders.

7. The many commendatory letters from industrial executives, deans, members, association leaders, etc. are too numerous to recite in this report. The Committee is naturally gratified at the favorable response, but interprets these reactions as a challenge to it, or its successor Committee, to continue the development of a program which will serve the interests of the engineer in industry, and thereby the engineering profession, American industry and, last but not least, the National Society of Professional Engineers.

Board Action: Report received.

Ethical Practices—V. G. Terenzio, P. E., reporting.

Recommended for Board action:

1. NSPE through its Washington office or a delegated competent representative should hold meetings with American Telephone and Telegraph Co. and General Telephone Corp. and obtain acceptance of uniform telephone listing policy with those companies and corporations notifying their subsidiaries of the accepted policy. (Some slight variation from established policy may be necessary.)

2. All state societies and chapters should be notified of results of high-level discussions and action by them be recommended with a sample letter provided for contact with state telephone companies.

During the past few months the Ethical Practices Committee has concentrated upon the following items:

1. Classified Directory Listings of Professionals: In order to determine the effectiveness of the program initiated by this society last year, a nation-wide survey was conducted by Mr.

Members of the NSPE Board of Directors are pictured here. Behind the Society's shield is Past President Clarence T. Shoch. On his left is T. Carr Forrest, Jr., president, 1953-54, and on his right is John D. Coleman, president during 1952-53.

Otto H. Hall, P. E., on behalf of the group. It is evident therefrom that much remains to be done. Perhaps the ultimate answer will rest in agreements mutually acceptable to society and utility *within and along state lines* rather than according to a uniform pattern across the nation. These would be predicated upon the principle that we are really intent upon restricting the engineering title to those who have established their legal competency rather than upon the shape and form of phone book listings.

2. Engineering Advertising: The committee tried to establish a formula which would specify the good and the bad of engineering advertising practices; certainly to a degree beyond the scanty coverage of the present Canons. This proved a bigger task than anticipated. In the interim the committee offers the following for approval:

> *"Circumspect advertising may be properly employed by the engineer to announce his practice and availability. The form and manner of such advertising shall satisfy in all respects the dictate and intent of the Canons. Only those media shall be used as are necessary to reach directly an interested and potential market, and such media shall in themselves be dignified, reputable and characteristically free of any factor or circumstance that would bring disrepute to the profession or to the professional using them. The substance of such advertising shall be limited to fact and shall contain no statement or offer intended to discredit or displace another engineer, either specifically or by implication.*

3. Service as an Advisory Board: In this field the committee dealt with matters such as the retention of legal counsel, interpretation and consolidation of ethical codes, competitive bidding and the improvement of registration laws. Opinions were also advanced in connection with the subject matter of the two activities above listed.

Board Action: Approved policies regarding advertising and telephone listings.

Hqs. Housing—S. L. Stolte, P. E., reporting.

Since the report of the Advisors on Headquarters Housing to the Board at Charlotte, North Carolina in February, contracts for construction of the National Society Headquarters Building have been awarded to Joseph F. Nebel, General Contractors, Washington, D. C. and to the Westinghouse Company for the elevator. Total of these two contracts amounts to $320,000. Ground has been broken and the work has commenced and is proceeding according to schedule. We are currently in the process of certain change order considerations with the Contractor to comply with recommendations that have been made by the Washington, D. C. Building Department. Many of us undoubtedly will have an opportunity to inspect the progress of the work on our visit to Philadelphia, routing ourselves through Washington, D. C. at that time.

. . . as of the middle of May, we still need approximately $120,000 to complete the $400,000 total offering of Building Participation Certificates. You will recall that at the Board Meeting in Charlotte, we asked each of the National Directors to raise a state quota equal to $5.00 times the number of members in the state society. We further indicated that we at least wanted a commitment for such bond purchase payments by September 1, 1955, if we were to meet the requirements of the construction schedule. President Shoch's memorandum of April 29, 1955 to the National Directors outlines in detail the rather meager response to Building Fund Participation Certificates from the period March 1 through April 15 and very few subscriptions have been received beyond the latter date.

The results thus far indicate that if we are to have this fund underwritten at an early date the procedure as established at Charlotte needs to be carried out by the members of the Board of Directors. It seems only logical that this campaign should proceed now so that there be no questions regarding financing the new Headquarters.

Board Action: Report received.

Interprofessional Relations—R. A. Freese, P. E., reporting.

Recommended for Board action:

1. Approval of the report, and direction that copies of the documents prepared by the joint AIA-NSPE Interprofessional Relations Committee be distributed to all State Societies for consideration of their appropriate committee.

During the past year, the Interprofessional Relations Committee has exerted its major effort in fostering greater cooperation with the profession of Architecture. Our committee is in general agreement on the following documents and has discussed them with committees of AIA, ASCE and ASME with results that range from "tentative approval" to "no objections." Therefore we respectfully request that the Board of Directors receive this report and direct that copies of these documents be distributed to all State Societies for consideration of their Interprofessional Relations (or Architect-Engineers) Committee.

The documents are as follows:

1

Standard Form of Agreement Between Architect and Engineer. Based on fixed sum fee or percentage of contract cost.

2

Standard Form of Agreement Between Architect and Engineer. Based on expenses plus a fee or multiple of expenses.

3

Standard Form of Agreement Between Engineer and Architect. Revisions to 1 and 2 for use where engineer is principal.

A revised Interprofessional Code of Practice for Architects and Engineers is also under discussion with the appropriate AIA committee but this has not advanced sufficiently to present to the Board. We recommend that our successors work toward the completion of this effort.

To complete the record, the committee received Board approval at the October 1954 meeting on their recommended policy statement for the selection, employment and payment of Commercial Testing Laboratories on engineering construction projects.

Board Action: Report approved.

Legislative—Vice Pres. John B. Jardine, P. E., reporting.

Introduction—The Annual Meeting occurs this year, as in the past, at a time when Congress is just entering the second, or action, phase of the current Session. As a result, this report can cover only the current status of major legislative items of interest to NSPE, with some estimate, where possible, of anticipated result.

Future developments will be reported through the Legislative Bulletin which now circulates to approximately 6,000 members per month. As in past years, a Summary Legislative Bulletin covering major developments of interest to the engineering profession will be sent to all members at the close of the current Congressional session.

Manpower Legislation—The House Armed Services Committee has reported the National Reserve Plan with some modification from the original plan proposed by the Administration. The revised bill does not contain a provision for a national engineering and scientific personnel advisory board, as recommended in the NSPE testimony. However, it does authorize the President to make specific findings that certain persons with critical skills engaged in critical defense supporting industries are eligible to fulfill their military obligation through six months of active duty training and seven and one-half years of reserve obligation. A further provision requires the armed forces to continuously screen the Ready Reserve and transfer to the Standby Reserve those possessing critical civilian skills in numbers beyond the military requirements for those skills, except for personnel who have military skills for which there is an overriding requirement.

It will be recalled that NSPE consideration of this legislation was handled through a Special Committee on Engineering Manpower, with the Chairman of the Legislative Committee serving as Chairman of the Special Committee, joined by the Chairmen of the Engineer-in-Industry, National Affairs, National Defense and Education Committees. When hearings are called by the Senate Armed Services Committee NSPE will present further testimony, again urging the establishment of an advisory board under civilian control.

Taft-Hartley Amendments—Congress has not taken any steps this year to modify the Taft-Hartley Act, and at this point it appears that the matter will go over until next year, or later. Consequently action has not been taken on the NSPE-sponsored Kearns "Freedom of Association" bill (H.R. 117).

Classification & Registration of Federally-Employed Engineers—Following our testimony before the Senate and House Civil Service Committees favoring a separate professional schedule for engineers in the Federal service, and a requirement for registration for engineers in grade 13 and above, consideration has been given to the desirability of seeking the introduction of separate legislation to accomplish these two points. Preliminary contacts have been made for this purpose and further discussions are planned.

Retirement Fund Legislation—A great many bills have been introduced to permit self-employed and other persons not under a pension system to set aside a portion of their income on a tax-deferred basis in order to build a private retirement fund. NSPE is supporting such legislation, in conjunction with other professional organizations. Action on such legislation has been delayed pending the formulation of Administration policy. NSPE will be prepared to support such legislation if new hearings are called, or if the appropriate Congressional committees report a bill following the present conferences with the Treasury Department.

Social Security Coverage of Self-Employed—By previous Board action NSPE is committed to seeking liberalization and eventual abolition of the restriction on income which may be earned without loss of retirement benefits between the ages of 65 and 72. While it appears that there will not be any further social security legislation this year, it is worthy of note that a number of bills have been introduced calling for voluntary coverage of other professionals, such as doctors, dentists and lawyers. Should these bills for voluntary coverage reach the hearing stage the Legislative Committee will interpret previous Board action, originally favoring voluntary coverage for self-employed P.E.'s, as authorization for further testimony urging the placing of self-employed engineers under a voluntary system. However, it should be noted that the Administration stand is as firm as ever against voluntary coverage and it is not anticipated that any voluntary system will be approved.

Scholarships for Engineering Study—The many bills to provide Federal scholarships for engineering and scientific study have been referred to the Education Committee for review and recommendation to the Board. Pending this report and Board action, the Legislative Committee does not plan any action.

Advance Planning of Public Works—The Administration-sponsored legislation to put the advance planning program on a permanent basis has been introduced. By past Board actions NSPE has supported the previous three advance planning programs. Under this policy decision NSPE will indicate its support of making the plan permanent and of increasing the available funds, as contained in the Administration's bill.

Board Action: Report received.

Membership—A. H. Kidder, P. E., reporting.

This report does not require action of the Board of Directors, but is presented for information concerning last year's membership activity and recommendations for next year.

At the Annual Meeting in 1954 the Membership Committee met to determine the feasibility of conducting a nation-wide membership contest. This proposal met with approval of the group and plans were drawn up to establish a fair and equitable method of administering such a contest. It was resolved that the best procedure would be to divide all states into five categories, based upon the number of prospective members in each state. Accordingly, categories were established as follows: *Group 1*—states having less than 500 prospective members: Ariz., Ark., Del., Idaho, Nev., N.C., N.D., R.I., S.C. *Group 2*—between 500-1,299 prospective members: Ala., Colo., Fla., Neb., N.M., Okla., Tenn., Utah, W. Va. *Group 3*—between 1,300-1,999 prospective members: Conn., Ga., Kan., Md., Minn., P.R., Va. *Group 4*—between 2,000-3,999 prospective members: D.C., Ind., Mass., Mich., N.J., Wash., Wisc. *Group 5*—more than 4,000 prospective members: Calif., Ill., Mo., N.Y., Ohio, Pa., and Texas. Basis for the number of prospective members was the June 1954 NCSBEE report. Using the total number of registered engineers in the state, minus out-of-state residents and then making allowance for the state's membership a figure was established to place each state in its respective group. Current and arrears P.E.'s only were included in the contest as it was felt that this might serve as an impetus to membership chairmen to keep the delinquent list at a minimum. Computations within the respective groups were based on net gain per one thousand potential P.E. members. E.I.T. members were not to be included in the contest as many states do not have provisions for this type of membership. The contest commenced on June 1, 1954 and terminated April 30, 1955. The contest winners in each group were: Group 1—*Nevada;* Group 2—*Nebraska;* Group 3—*Kansas;* Group 4—*Wisconsin* and Group 5—*Missouri.*

The total net gain of P.E. members for the contest period was 1,286, which was somewhat short of the goal we had established. An analysis of membership gains over the past five years is presented in tabular form as of April 30 each year for ready reference as to this year's membership status.

Date	*Total Members*	*Per Cent Increase*
1951	24,150	7.7
1952	25,269	4.5
1953	27,139	7.4
1954	29,393	8.3
1955	31,559	7.4

To supplement the above information it should be pointed out that NSPE has a greater number, as well as a greater percentage of paid-up members as of April 30, 1954 than at any other comparable period over the past ten years.

In order to facilitate the distribution of membership information to the State Societies, this committee has assembled a mailing list of the State Membership Chairmen, which has proven to be of considerable assistance in disseminating information concerning membership programs and publications.

In recent issues of the Membership Memo, it has been urged that this year's State Membership Chairmen assume personal responsibility for seeing to it that their successors are adequately briefed and their committees organized so that this extremely important phase of the work may carry through the summer months without the usual letdown. It was further pointed out that Chapter Presidents and Membership Chairmen should take steps now to ensure continuity in membership activities.

This committee feels that this year's membership contest has been successful in establishing a spirit of competition between the various states and although the actual membership gain was below last year, it is believed that much of the spirit will carry over into the forthcoming year. It is highly recommended that a membership contest, similar to the one just brought to a close, be initiated in the early part of this administrative year to ensure that the interest that has been aroused will not level off during the relatively dull period during the summer months.

The Committee and the many friends of Professor Joe Butler were indeed saddened to learn of the death of this prominent member and successful membership promoter. He was a tower of strength to NSPE and the engineering profession. It will be

recalled that during a one year period, he personally recruited more than 200 new members. In view of the enthusiasm, integrity and character of Professor Joe Butler, it is no small wonder that he will be missed, particularly by this Committee and his many friends.

Board Action: Report received. Further, the Board voted unanimously to approve a statement honoring the late Joe B. Butler, P. E., former National Director from the State of Missouri. The statement read as follows:

* * *

TRIBUTE

(Adopted by the Board of Directors of the National Society of Professional Engineers June 4, 1955)

The President, Officers, Directors, and Members of NSPE, in Annual Meeting at Philadelphia, June 4, 1955, record with deep sorrow the passing of Director Joe B. Butler since the time of our last meeting.

His exemplary devotion and loyalty, and his untiring efforts in the interests of the profession and the Society were an inspiration to all.

His associates in the Society now express their warm sympathy to the family of Director Joe B. Butler, and cause a copy of this tribute to be sent to Mrs. Butler and a recording to be spread upon the Minutes of this Society Meeting.

* * *

National Defense—F. Kraissl, Jr., P. E., reporting. Recommended for Board action:

1. It is recommended that the Board of Directors adopt Resolution 11-55 calling for the government to make greater use of engineers in planning the Nations defense.

The following discussion is presented for information only and does not require specific action of the Board.

The National Defense Committee is able to make this report, first based on an exchange of ideas through correspondence but much more importantly by meeting in person on April 15 for a one day session at our National Headquarters.

2. The first item on the agenda was a consideration of the role of Professional Engineers in dealing with National Defense problems. As a result of a previously authorized survey, it was determined that 27 states had returned a questionnaire form indicating that 14 states had a National Defense Committee. This led to a regular motion duly seconded and carried that a recommendation be made that our National Society strongly recommend to all State Societies not having a National Defense Committee, that such a committee be formed at the earliest possible opportunity so that the program of the National Defense Committee can be completely effective.

2.1. It was agreed that in considering matters of National Defense our deliberations and recommendations must be limited to those aspects with which Engineers are or should be concerned because of their professional status.

2.2. Discussion and formal action indicated three areas in which the committee felt definite action is necessary.

2.2.1. Consideration of defense manpower needs as related to civilian requirements.

2.2.2. Legislation to accomplish desired objectives.

2.2.3. Effective activity in the field of civil defense and disaster control.

2.2.3.1. It was felt that Engineers must be used more in the administrative and planning level in this activity.

2.2.3.2. It was the consensus that a public relations job needs to be done in creating an awareness of our problem and the necessity of dealing with it.

3. The role of the Engineer in Civil Defense as recommended by FCDA was discussed in detail. It was recognized that FCDA is a recommending body and that the states are free to organize any plan that is considered to best suit the needs of each. It was concluded that a most important service would be performed if the National Defense Committee of each state Society would study the State Civil Defense program involving Engineers, dispassionately analyze the pros and cons, concluding with recommendations for a better operation. It is proposed that these recommendations be sent to the National Defense Committee of the National Society which would be given the assignment of utilizing them in preparing a report for FCDA with a view toward improving the type of organization and activity recommended by FCDA to the states.

3.1. The correspondence between the Chairman and Mr. H. L. Aitken of FCDA was read and discussed with relation to Industrial Protection. It was noted that comments from our committee were invited and would be welcomed.

4. It was the concensus that it is mandatory that greater utilization must be made of Engineers by the military services in the planning of our National Defense.

4.1. The National Defense Committee recommended the adoption of Resolution 11-55.

4.2. If enacted it is proposed to use this resolution as a basis for spotlighting our beliefs in this matter and possibly suggest to state National Defense Committees that the situation be discussed with State Congressmen as a means of improving our National Defense.

5. Careful consideration was given to the matter of military manpower with specific attention to the use of engineers.

5.1. The report of the special committee on engineering manpower to the Board of Directors, dated February 18-19, 1955 was carefully reviewed.

5.1.1. All opinions for determining current NSPE policy were concurred in with the exception of the latter part of paragraph 3. The following observations of the National Defense Committee have been submitted to the Engineering Manpower Committee of NSPE for their consideration as a revision to the policy statement adopted at the Charlotte Meeting. As of the date of writing this report, the recommendation of the Engineering Manpower Committee with respect to this suggestion was not available.

5.1.2. The exception taken by majority vote was to the section reading, "It is suggested that the Engineering Profession would be well advised to do everything possible to encourage young men who are considering an engineering career to obtain their military service through selective service or otherwise *before entering engineering school.*"

5.1.3. The National Defense Committee feels that this is an unwise position for N.S.P.E. to assume for the following reasons.

5.1.3.1. Provision has been made for educational deferments to those students who are in the upper section of their classes or who by examination can indicate their qualification for higher education. It would seem most unwise to go on record to the effect that N.S.P.E. is not recommending to prospective engineers that they avail themselves of this provision and is also inconsistent with paragraph 5 of the report recommending continued deferment for engineering students.

5.1.3.2. It is the conviction of many, interested in education, that when a prospective college student breaks the continuity of academic training between high school and college, that many never resume their planned career. It is believed unwise for N.S.P.E. to go on record encouraging this break in training. It is believed that this is purely a personal problem with each young man and should be decided by him without involving N.S.P.E. in any responsibility for abandoned or discontinued engineering careers.

5.1.3.3. It is believed that when an individual has graduated from an engineering school, he is more valuable to the Armed Services, even if unable to be used in an engineering assignment. He should be good officer material and perhaps could qualify for officer candidate school.

5.1.3.4. The fact should not be overlooked that many engineering schools have Reserve Officer Training Corps with military training integrated in the curriculum so that students who so desire may qualify for a reserve commission upon graduation. This provides the services with trained engineering officers, many of whom have adopted military service as a career, and others who have obtained valuable experience as well as serving their country through tours of extended active duty. It is believed that N.S.P.E. would be unwise to adopt a policy that would tend to deny the services this source of officer personnel and individuals, the opportunity to qualify for a reserve commission.

5.2. The legislative status of the National Reserve Plan was discussed but it was believed futile to consider details at this stage of development.

5.3. The committee voted unanimously to go on record against the Teague Bill and recommended to our National Directors that this action be taken.

5.4. While no specific resolution was considered necessary, it was strongly recommended that steps be taken to get more engineers appointed to civilian high level planning assignments in National Defense such as War Resources Board, Office of Defense Mobilization, F.C.D.A. and similar agencies both in permanent and advisory capacities.

5.4.1. The statement was made and concurred in that our National Society must ferret out such assignments and be alert to getting them filled by engineering representation.

(*Continued on page 48*)

NEW Processes . . .

Automatic Data Loggers Promise Savings In Municipal Water Systems

Municipal water works systems may soon be able to save tax payers thousands of dollars by installing modern automatic data logging equipment in centralized control stations, according to Fischer & Porter Company, Hatboro, Pa.

Readings from instruments in widely separated points in the water system can be transmitted instantaneously and continuously to the central station for control, statistical, or accounting purposes. Leased telephone wires, TWX system or microwaves can be used to carry the data.

Provision can be made for supervisory control of remotely located pumps. This enables a waterworks operator to start and stop a complete pumping station from a central location and receive positive confirmation of his action.

Readings transmitted include reservoir and tank level, pump and pipeline pressures, and flow rates. Practically any variable which can be translated into an electrical signal can be handled. F & P call the system a centralized data readout for waterworks. Variables are scanned continuously and sent instantly over wires or by microwaves to the automatic data logger in a central control station.

Data received in the central station is automatically entered on a central log sheet, punched cards or punched tape. The punched cards or tape can be fed into business machines where the information is converted into written form, saving operating personnel the time needed to manually log, collate and interpret information.

Although it would not be economical to use the system for measuring and recording water consumption in homes or the average building, it can be used effectively to measure automatically the water consumption by large users and to transfer this information to punched cards or tape for invoicing and accounting.

The system devised by Fischer & Porter Company is an electro-mechanical system. Standard components, already being manufactured for industrial use, are used to keep the cost of the system within economical limits.

Isoscope "Sees" Through Steel

A new inspection tool which makes use of radioactive Cobalt 60 and is capable of radiographing—or "seeing through"—thicknesses of steel up to seven inches, has been developed by The Babcock & Wilcox Company. The unit has been christened the "Isoscope" a derivation of the words "isotope," a radioactive material, and "scope," for the power to see through metals. The "Isoscope" which has been under study and development by B&W for the past three years, requires only one-third the exposure time of a million volt X-ray unit and paves the way for wider use of atomic energy in this industrial application.

The largest allocation of radioactive Cobalt 60 ever authorized to industry for radiographic work was assigned to Babcock & Wilcox for the "Isoscope" at Oak Ridge National Laboratory on October 11, 1954. The material was loaded into a special dual-purpose spherical lead container designed and built by B&W's Barberton, Ohio works to handle the radioactive material during shipment. The container was converted into a part of the radiographic machine upon arrival at its destination.

The lead sphere of the "Isoscope" is encased in a steel jacket having a cylindrical rotor section built into it. By revolving the rotor 180 degrees the radioactive source can be brought from the "safe" position to a point in line with the coned opening in the steel jacket allowing a beam of radiation to escape. This, in effect, results in a unit which can be turned "on" and "off."

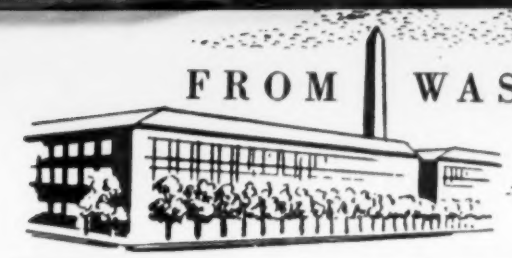
The total charge placed in this unit was 1008 curies of Cobalt 60. The charge is comprised of small discs stacked one on top of the other like coins in a coin changer. The radiation is taken from the top of this stack so that the focal spot size compares favorably with existing high voltage X-ray equipment.

The balance of the "Isoscope" consists of a modified electric platform lift truck having a "lead cab" built on the back and a "turn-table" mounted on the front platform. Trunnions on the turn-table receive the lead ball containing the radioactive material. Cover plates mounted on top and bottom of the lead ball carry the cylindrical rotating mechanism. This assembled unit can be raised or lowered through 8 feet, rotated vertically through 210 degrees and horizontally through 360 degrees.

The lead cab provides protection for the operator and contains controls for the operation of the machine. The controls consist of a timer, an "on"—"off" button and a green, amber, and red light system which informs the operator of the position of his source at all times.

As a pioneer in the use of radiographic equipment in industry, Babcock & Wilcox believes that this tool will enable the small foundries and plants to invest in high energy radiographic equipment where often the cost of high voltage equipment was prohibitive.

The "Isoscope," capable of radiographing thicknesses of steel up to seven inches, is being "aimed" at a test specimen.



FROM WASHINGTON

By
Milton F. Lunch,
N.S.P.E.'s Legislative Analyst

IMPROVING FEDERAL RESEARCH AND DEVELOPMENT

In a reversal of form, the Hoover Commission has declared its all-out support for federal research and development operations and has urged a considerably expanded program. In previous reports the Commission has been critical of expanded government programs and has urged a number of cutbacks or elimination of programs.

More significant to the engineering profession than the recommendation for additional funds, is the Commission's strong endorsement for professional supervision and control of the research and development program and higher compensation for civil service professional employees. These, as well as a number of other specific recommendations, are fully in accord with the general and specific policies of NSPE in their particular areas of impact. The endorsement of the Hoover Commission should go a long way toward bringing about the type of reform long urged by the Society.

The report, "Research and Development in the Government," (available from the Government Printing Office at 40c per copy) is based on the work of the Subcommittee on Research Activities, composed of five distinguished engineers and scientists. The Chairman of the Subcommittee was Mervin J. Kelly, President, Bell Telephone Laboratories. Other members were: Frederick L. Hovde, President, Purdue University; Robert M. Kimball, Massachusetts Institute of Technology; C. Guy Suits, Vice President and Director of Research, General Electric Company; and Clyde E. Williams, President, Battelle Institute.

◄ Dr. Clyde Williams,
President,
Batelle Institute.

Mervin J. Kelly, Chairman, ►
President,
Bell Telephone Laboratories.

Unlike the procedures in previous reports, the Commission merely condensed the reasoning and findings of the Subcommittee and endorsed in full their recommendations. The general theme of the report, as applied to engineers and scientists, is well indicated by a paragraph in the preface: "There is no tribute great enough to express the Nation's obligations to its scientists, engineers, and military personnel, for their contributions to our constantly-increasing productivity and the strengthening of our national defense. And there can be no relaxation in this effort."

The Commission notes that for the fiscal year ending June 30, 1956, the total expenditures of the Government for research and development will be about $2,400,000,000. Including the research and development activities carried on by industry and nonprofit institutions the aggregate sum probably exceeds $4,500,000,000, the report said.

"This organization of Research and Development in the Government is the largest integrated scientific and technical endeavor that any nation has ever attempted," it was stated. But the Commission noted that the fiscal 1954 basic research programs of the three military Departments are only at the annual rate of $20,000,000. Such a level of basic research is inadequate, it was stated, because the scientific and technical knowledge that is basic to our progress in new weapons systems is obtained through basic and applied research, which are the first two functional areas of the research and development operations. It was recommended "That the level of basic research in the Department of Defense be significantly increased . . ."

It was recommended that an Office of Assistant Secretary for Research and Development be established in each of three military departments. The Assistant Secretary should "be trained in science and technology and experienced in the operations and administration of research and development,"

(Please turn the page)

(Continued from previous page)

the Commission cautioned. In addition, the office should have a small staff trained in science and technology and experienced in the operation and administration of research and development. The Commission observed that the Air Force has such an office and that the appointee "meets the professional requirements the Task Force Subcommittee recommends." It was also noted that in the three departments, ". . . the personnel involved (in research and development) have largely not been trained in science and technology or experienced in research and development operation and administration." This fact was said to be the area of greatest organizational and personnel inadequacy in the research and development field, ". . . and one that promises greatest reward through correction."

Another major suggestion is that the Assistant Secretary of Defense for Research and Development appoint a standing committee, reporting directly to him, "of outstanding basic and applied scientists." This Committee would canvass periodically the needs and opportunities presented by new scientific knowledge for radically new weapons systems. This suggestion followed the comment by the Commission that the Armed Services "are not sufficiently daring and imaginative in their approach to radically new weapons and weapons systems." Recent approach in this direction have been largely inspired through informal proddings by civilian scientists and technologists, the Commission said. "While such proddings have been productive, so vitally important an area should not be left to chance."

◄ Mr. Robert Kimball,
Vice President,
Massachusetts Institute of Technology.

Dr. Frederick L. Hovde, ►
President,
Purdue University.

Where choice is possible, operations of research and development should be performed at that place in the Nation where they can be done most effectively and with the greatest efficiency, the Commission noted. In commenting on this recommendation, the Commission said that research and development and design operations are, in general, best performed by civilian agencies. Operations performed in the military departments "are generally at a lower level of effectiveness than could be realized if suitably placed in the civilian economy." The Task Force Subcommittee estimated that in 1954 there was a $125,000,000 volume of such work that was susceptible to shift into the civilian economy. In this connection the reference is primarily to industry and academic and nonprofit institutions.

Even with the shift recommended above, the Commission said that some 30 per cent of the appropriated research and development funds would and must be expended within the Government in areas vital to overall success of the programs.

"It is, therefore, most important that the personnel have the highest professional competence."

Two important series of recommendations are then made to implement this significant question:

(1) Military Personnel—Those at the officer level are generally men of high personal qualities and with professional equipment for their jobs because of the excellently organized professional training programs. An increasing number of officers are receiving training to the doctorate levels in science and technology.

But, with the growing technical complexity of warfare and the increasing dependence of our military strength on the qualities of our weaponry, there are not a sufficient number of the younger officers in the training programs to provide for the increasing demands for technical officers.

The constant rotation of officers between research and development and operating command positions ignores the urgent need for increased specialization. "The development of a sufficiently competent corps of specialists in research and development will not be realized unless the length of the assignments to a particular post is materially increased."

(2) Civilian Personnel—"The quality of the civil service employee contribution to research and development suffers through inability to acquire and retain in the program enough men of adequate professional training and competence." The professional training programs for civilians are good, but improvements in the training programs alone will not meet the situation.

"Generally, higher pay levels and a larger number of high level civil service positions are essential for the improvement of the situation and probably essential to prevent deterioration." The compensation for civil service professional employees should more nearly be competitive with industry.

The Commission report has been hailed by leading newspapers and others and undoubtedly has had the warmest reception of any report yet issued by the group. It may constitute the straw which will break the inertia which has been holding up long-needed reforms in the classification, recognition, treatment and compensation of the professional personnel in engineering and scientific work for the Government; for the report may drive home the realization that upon such a small group rests so much of the National hope for Peace and Prosperity.

Positions Open For Patent Examiners

The U. S. Patent Office has announced its need for additional Patent Examiners and Design Patent Examiners. Qualifications for Patent Examiner positions include a bachelor's degree or its equivalent in the major fields of engineering, or a degree including or supplemented by 24 semester hours in physics or 30 hours in chemistry. Applicants for Design Patent Examiner positions are required to have a bachelor's degree or its equivalent in architecture or product design, or a degree including or supplemented by 12 semester hours in physics, chemistry or engineering courses.

Applicants must file for the U. S. Civil Service Commission examinations as stated in Announcement No. 331, Patent Examiner, or Announcement No. 436 (B), Design Patent Examiner. Copies of the announcements and the necessary application forms are obtainable from any Post Office or directly from the U. S. Patent Office, Washington 25, D. C.

Marines Need Electronic Engineers

The United States Marine Corps Headquarters Office has recently announced its need for electronic engineers at the GS-11 level. The qualifications required are a bachelor's degree in electrical or electronic engineering plus two and one-half years of progressively responsible electronic engineering experience; or six and one-half years of progressively responsible electronic engineering experience without the college requirement; or any equivalent combination of education and experience.

Applications should be directed to the Commandant of the Marine Corps, Code ABT, Headquarters U.S. Marine Corps, Washington 25, D. C.

Designed for Service . . .

Are you getting the most out of AMERICAN ENGINEER Reader Service features?

These columns: New Processes
New Literature
What's New

offer you valuable information on new developments, instructional material and new products; plus occasional product samples for your testing.

Read them now and in every issue—they're *designed to serve You.*

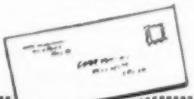
Nuclear Engineering at New York University

The New York University College of Engineering will inaugurate programs in nuclear engineering and engineering science this fall, according to Dean Thorndike Saville. A graduate program, for which the degree of Master of Nuclear Engineering has been authorized, is the first in the New York metropolitan area.

BE RECOGNIZED . . .

Display This New and Striking P. E. Emblem on Your AUTO

Here is a beautifully colored and practical auto medallion emblem which every professional engineer can display with pride. No bolts or brackets. An adhesive backing cements emblem to trunk lid or other metal surface. Just press on. Leaves no mark on paint when removed. The 3¼-inch emblem bends easily to fit curved paneling. Design finished in maroon, black, white, and chrome. A completely new emblem, it will afford professional recognition with dignity and attractiveness. ORDER YOURS NOW FOR ONLY $1.00.



MAIL THIS COUPON TODAY!

NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS
1121 Fifteenth St., N.W., Washington 5, D. C.

Please send me at once the 3 ¼-inch P.E. Emblem for my car. I enclose.....check.....money order for $1.00 to cover the cost of the emblem, handling and mailing charges. Send to:

(Name) .....

(Address) .....

(City) .....(State) .....

I am registered in (name of state).....

N.S.P.E. Believes

THE ENGINEER—MEMBER OF A LEARNED PROFESSION

BY PAUL H. ROBBINS, P.E.

Executive Director

N.S.P.E.

NSPE has believed from the day of its founding that as engineering assumes a more important professional status, responsibility accrues to each individual to be representative of a learned profession. This fundamental belief is exemplified in the organization of NSPE and in its programs by their emphasis on the individual member and by the firm resolution that only as individuals are accorded professional status will the engineering profession assume the position to which it is entitled. Such professional status, however, is not bestowed upon individuals unless so merited.

It is in support of this fundamental belief that NSPE's organizational pattern is based on the individual and provides an opportunity for him to work with his fellow professionals, from all backgrounds of education and employment and fields of specialization, through the local Chapter, State Society, and National Society. While there may be differences of opinion among engineers as to methods by which the individual can best be assisted in his professional development, there is unanimous agreement that the profession has a responsibility to assist young men and those being trained for entry into the engineering profession in a sound grounding in these fundamentals.

The recent meeting of the American Society for Engineering Education, concerned with the kind of education which will best suit potential engineers for their role as members of a learned profession, was highlighted by discussion of procedures for improving the foundations of professional stature. An important study has just been completed by ASEE on the evaluation of engineering education. This report considers the fundamental problems being faced by those responsible for engineering curricula with the expanding horizons of technology and the need for grounding in fundamentals of science and mathematics while at the same time endeavoring to give at least some orientation in human relations and the social implications of technological development to the embryonic engineer.

A second important study reported at the ASEE convention delves extensively into the importance, need and extent of the training received by engineers in the humanistic-social realm. The study, supported by funds from the Carnegie Foundation, has progressed only far enough so that an interim report could be made; but implications were presented that the final report, to be available sometime this fall, will focus attention on several problems in this important field.

In discussion of these reports, reference was made to findings outlined in various phases of the Executive Research Survey series conducted by the Professional Engineers Conference Board for Industry in cooperation with NSPE. Members of NSPE will recall that these surveys, touching on facets of the professional development of engineers in industry, have pointed out some of the deficiencies both industry and individual engineers have felt existed in their education; some of the needs which industry has found it necessary to supplement with training programs after employment; and some of the aspects of human relations which require engineers and management to recognize the unique conditions under which engineers are most productive of professional effort.

It is coincidental that the Annual Meeting of ASEE was held at Pennsylvania State University where, at the Commencement only two weeks previously, President Eisenhower had indicated the problem faced by the Nation in that the development of humanity and civilization needs both the practical productive training of the scientist and engineer and the philosophical, humanistic training of liberal and fine arts. Eisenhower's presentation presents to educators the problem that we seem to train for one or the other, but have difficulty—both in time and in creating interest—in accomplishing a combined training of individuals along this line.

Whether or not engineers receive their appreciation of human relations and social implications as a result of their formal training in the educational institutions or by astute observation and application of principles from the college of life, NSPE believes it incumbent that the engineer, a member of a learned profession, recognize his responsibility of leadership and initiative in applying the straight thinking for which he has been trained to the increasingly complex problems of civilization.—***End.***

Wanted: Professional Engineer Executives

By John L. Handy,

President, Handy Associates, Management Consultants

PROFESSIONAL engineers are being called upon more and more to serve in executive positions. This trend has been most pronounced in the last few years and we, in the business of finding competent executives for industry, feel that it is likely to continue.

What does industry expect to find in a junior executive and how can the necessary qualifications be developed? Are professional engineer executives born with the particular qualifications that make for success or can these qualifications be acquired by education and experience?

In order that we may better analyze the problem, let us consider first the qualifications for the average executive position.

The president of a large chemical company when asked to give the requirements for a top-level executive gave the following formula:

50%—Ability to command the respect, loyalty, and good will of associates and subordinates in both business and personal relations.

25%—Ability to weigh problems objectively and with balanced judgment.

15%—Ability to develop subordinates by wisely placing responsibility and authority.

10%—General knowledge of the business.

Another point of view may be obtained from a list of characteristics on a personal analysis form for supervisory and professional employees at one time used by a well known company. Although the points are not weighted, they appear to increase in importance from Number 1 to Number 10.

1. **Consider the command of knowledge essential to specific work.**
2. **Consider original contributions made to improve methods and to add to existing knowledge.**
3. **Consider quantity of work accomplished and ability to produce results.**
4. **Consider accuracy, thoroughness, and dependability of results, the ability to turn out work which meets quality standards.**
5. **Consider the sense of proportion, common sense, and judgment shown in work.**
6. **Consider cooperation with other departments of the company and the knowledge and appreciation of the problems of other units.**
7. **Consider success in building and maintaining good will, respect and loyalty of subordinates.**
8. **Consider success in developing and improving subordinates by imparting information, arousing interest and ambitions and correctly interpreting company policies.**
9. **Consider success in planning and organizing work and in delegating authority wisely to others.**
10. **Consider intellectual honesty and the courage to defend principles and conclusions which careful and logical thought indicate are constructive industrially, economically, socially and morally.**

A FEW years ago a questionnaire was sent to several thousand hard-headed, fact-loving engineers asking for the qualifications of an executive in the order of their importance. The replies, when tabulated, showed an overwhelming majority specifying character and honesty as the number one quality. Common sense, tact, cooperativeness, etc. constituted the next important group of characteristics, and specialized knowledge was last.

The head of the Chemical Engineering Department of a well known scientific institution was asked this question, "When companies ask you to recommend a graduate for employment, what single characteristic do you give major importance and weight in making a selection?" His answer was, "Dependability."

In all of these examples you will note a separation of characteristics into two major groups.

1. **What the man knows.**
2. **What kind of a man he is.**

What a man knows is important when a college graduate is being chosen for his first job. The fact that the man has a degree in chemistry, industrial engineering, architecture, electronics, mechanical engineering, etc., is

one of the major qualifications. Equally important, however, is dependability and personality, cooperativeness and other personal characteristics. A very high scholastic rating may be a major factor in choosing a research man. However, a graduate with only average scholastic rating, who is dependable, well balanced, cooperative, and friendly may make a better candidate to train for foreman and works manager.

Specialized knowledge is more of a factor in the lower echelon positions. As a person becomes a junior executive and moves on up to higher executive positions, specialized knowledge becomes less important and administrative skills and personal attributes (what kind of a man he is) become more important.

How can a junior engineer equip himself to be a top-level executive? Professional and specialized knowledge

can be acquired by reading books, taking college extension courses, and by experience in working with, or under, competent people in a job.

The importance of a line title cannot be overemphasized. For instance, a line executive whose experience has been as a foreman, department head, superintendent, plant engineer, Assistant Research Director, etc., is far more valuable for promotion, or marketable to another company, than one who, let us say, has been "Assistant to" one of the department heads listed above. One bit of advice, therefore, to junior engineers, in order to improve their value as an executive, is to get a "line" job with a title and avoid "Assistant to" jobs even though they may feel important by being an assistant to a top executive. An "Assistant to" may die with his boss whereas an assistant department head may succeed his boss. "Assistant to's," on an average, have very little marketability.

How about acquiring those personal characteristics which make for a successful executive? Some few men are blessed with a boss whose example is an inspiration and help, and whose personal qualities can be used as a guide or model by a subordinate. Unfortunately, the examples of this are not numerous.

The business of becoming tactful, dependable, honest, cheerful, enthusiastic, helpful and of acquiring common sense and judgment cannot be obtained from books. It is a combination of basic homelife and environment, one's associates (a man is known by the company he keeps), hard knocks, having to work hard for what you get, religion, marriage, and a host of other things which help to make the man. Some people are born with these characteristics, others acquire them through bitter experience and hard knocks, others attain them through the happy association with great men and women. There is no formula like there is for acquiring professional knowledge and experience. If it were easy, business would be equipped with lots of "Chiefs" and few "Braves."

Specialized knowledge is of great value but one can hire experts in almost any line whereas real executive leadership and administrative ability are at a premium.

It might be of interest at this point to spell out some of the personal characteristics that should be found in the ideal executive.

An executive should be:

a. One who has character, honesty and integrity.

b. One whose thinking never stagnates.

c. One who has faith in the judgment of his subordinates.

d. One who subscribes to the theory that people and businesses *Get* in proportion as they *Give*.

e. One who carries on his daily work in the spirit of friendliness.

f. One who is firm and decisive but considerate and courteous.

g. One who is receptive to information and suggestion.

h. One who draws ideas from others and does not impress his views on subordinates. (The latter may agree because they believe it is wise to do so.)

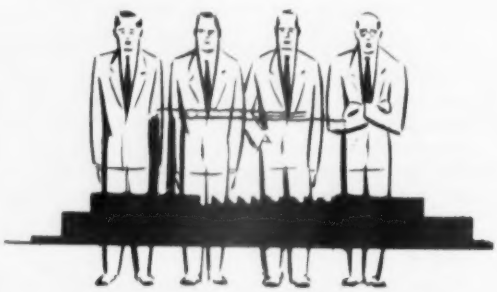
i. One who believes in others and does not habitually find fault.

j. One who does not habitually carry a chip on his shoulder.

k. One who is just in his decisions, tempered with reason and understanding.

l. One who is cheerful and enthusiastic, not sour, glum and vacillating.

m. One who practices what he preaches.



n. One who habitually exerts self control.

o. One who delegates responsibility to subordinates.

p. One who bases his judgment on facts, not snap judgments or opinions.

q. One who does not brag about his accomplishments.

r. One who has character, honesty and integrity.

In spite of the many examples in business of the failure to meet the ideal specifications, the professional consultant

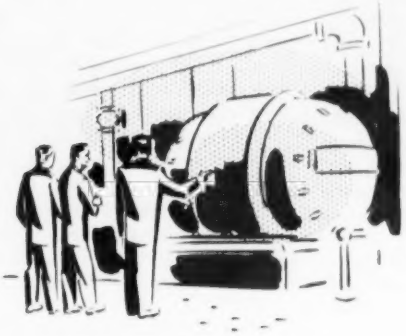
who is paid by a company to find an executive for it usually finds that acceptance hinges on the following:

1. What is the man's education and experience in and for the job being filled?
2. Does the man "get along with people" and does he have common sense and judgment?
3. How about his character and personal habits?

The weighting of these factors depends largely on the executive position in question and the philosophy of the client.

A few general observations may be of interest to the young engineer hoping to become a successful executive.

1. Give each job that you fill, no matter how small, the best performance that you can because it is surprising how long a failure trails after you.
2. Appraise your progress at intervals, perhaps once



each year, and if your progress in gaining professional or personal experience appears to be ended, talk the matter over with your boss or with some informed person.

3. Gain as much professional knowledge of your field as possible so that you may become known as a leader. Make good use of participation in professional meetings and in the preparation of papers for publication. The better a person is known the more opportunities come to him.
4. Choose your friends wisely (a man is known by the company he keeps).

The engineer who by training has learned to deal with problems factually and objectively has a good start in building a well-rounded experience to make him a successful executive. However, he should recognize the fact that "What an executive is" is more important than "What an executive knows."—***End.***

About the Author . . .

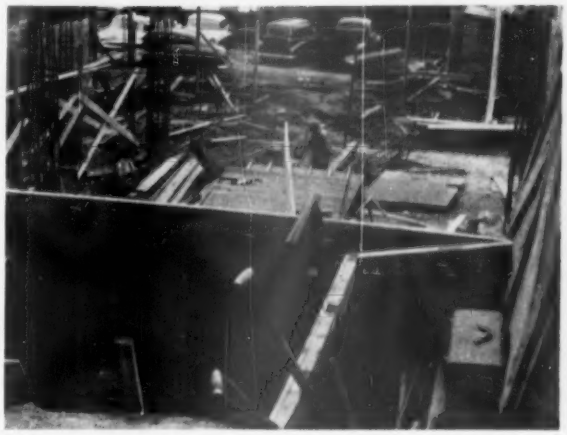
Mr. Handy

John L. Handy, who is president of Handy Associates, Management Consultants of New York City, is a 1914 graduate of Harvard University. He organized his own firm in 1944 following a successful career, first as a commodity and securities broker during the 1920's and 1930's, and later as an associate in the management consulting firm of McKinsey & Co.

He is also director of the Edo Corporation, College Point, Long Island, N. Y., and a member of the American Management Association.

His organization works in the fields of organization studies, management audits, salary evaluation, executive incentive compensation plans, executive recruiting, college recruiting, and executive development.

Construction Underway On New Hqs. Building



Off and away! Work begins on new building.

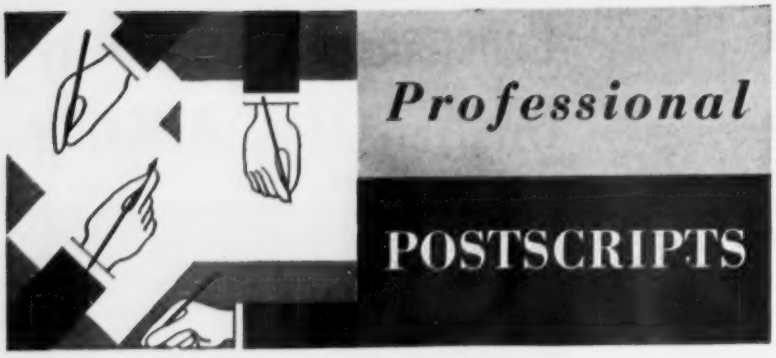
Is there anything readily recognizable from the above photograph? Perhaps not, at least at this early stage. But you are looking at the foundation of the National Society of Professional Engineers' Headquarters Building. Construction commenced shortly after the ground breaking ceremony 6 weeks ago and is now moving along as scheduled. It is hoped that before long NSPE's Headquarters will be located in its own office building in the Nation's Capital.

Presently, the Headquarters Office is split into three separate office buildings, which is brought about by the limitation of space. It is difficult to maintain the cohesiveness that is required in NSPE's operation under such a physical layout so it will be greatly beneficial to efficient operation when housing accommodations permit a consolidated effort toward the aims and objectives of NSPE.

At this writing $300,000 in Building Fund Participation Certificates have been sold. During the past few months, subscriptions to the certificates have not come in as rapidly as officials hoped they would. Perhaps many of the members believe that the issue has been underwritten. Such is not the case, as there are approximately $100,000 in Building Fund Certificates remaining to be purchased. Also, it should be pointed out that this $100,000 should be subscribed to in the near future, since construction on the new building has commenced and NSPE will be faced with the prospect of meeting certain expenses in connection with the building program. Occupancy is still anticipated by the early part of 1956 and it will be necessary to make sizable expenditures between now and the date of completion.

Members are urged to take advantage of the opportunity to make a wise financial investment in the new Headquarters Building and at the same time lend their support to the erection of an engineering headquarters building close to the seat of the Federal government.

In case the subscription form that was sent to each member with a prospectus has been mislaid, a note to the Headquarters Office will bring an additional form and any information that may be desired about the building. Do not delay—check should be made payable to "Headquarters Building Fund, NSPE."



First from the mailbag this month is a piece sent to us by a reader and written by William Russell White, Rear Admiral, United States Navy, Retired. It deals with that old intangible "leadership" and the Admiral has some novel ideas on how more people can learn more about it.

—PP—

Leadership is the aristocrat of all the callings.

Of all the cultures and regimes recorded in history, only China's has persisted as long as 30 centuries! Why?

Gone are the other ancient cultures and regimes. Most of the later ones amongst the Western tribes withered after a few brilliant centuries. Was their decadence due to poor leadership by their "creative minorities"? Could the latter have provided systems that effectively supplied a continuous succession of capable leaders?

With the same ancestors and heredity as our European cousins, must our current way of life also suffer a similar decadence and obsolescence after a few outstanding American centuries?

All the ancient, medieval and current cultures and regimes should be studied intensively, hoping to discover the causes of the many failures and the few successes.

Besides producing such technicians and craftsmen as lawyers, surgeons, clergymen, teachers, engineers, scientists, etc., American educational institutions should also strive, systematically, to develop unselfish, broad-minded leaders. The latter should be inculcated with an American doctrine of practical leadership that yet remains to be explored and scientifically developed. It is suggested that

1.—Leadership's elementary principles, conforming to the tribal mores, be taught in grammar and high schools;

2.—Leadership Departments be established in universities and colleges. Therein, the natural law and human relations should be explored as scientifically as possible, with emphasis on the spiritual values; the governing premises to be that the human dignity of individuals must never be infringed and that leaders must consider themselves not as owners but only as temporary trustees of power. (Recently such Departments have been established by the U. S. Naval Academy and by the U. S. Military Academy.)

Several hundred thousand dollars will be needed for the first two experimental years, while trying to develop the fundamentals of a doctrine of American leadership and the correct methods of their teaching. Several Foundations have funds available for such preliminary grants and for the additional grants that may be needed later on.

—PP—

Mr. Harold C. R. Carlson, chairman for Region II of the ASCE Civic Affairs Committee, and a member of NSPE, has sent along to us his report discussing the recent activities of his group. We have summarized this material below because we agree with Engineer Carlson that all the publicity possible should be given to the excellent work now being done by hundreds of engineers in this most vital field.

—PP—

West Virginia Society of Professional Engineers—Annual Meeting, September 22-24, 1955, Fairmont Hotel, Fairmont, W. Va.

NSPE Fall Meeting — October 14-15, 1955, Peabody Hotel, Memphis, Tenn.

Missouri Society of Professional Engineers—Annual Meeting, October 21-22, 1955, Kentwood Arms Hotel, Springfield, Missouri.

The Civic Affairs Committee of the A.S.M.E. is doing an excellent job in determining the extent of participation of engineers in community life. A questionnaire contained in the October 1954 issue of the Metropolitan Section Bulletin sent to all members in Region II brought forth interesting information concerning the part engineers have taken, or are now taking, in community activities. It has been thought by some that an engineer has a subjective personality; that his concentration on engineering problems in connection with inanimate objects keeps him away from participation in civic affairs—but the responses to the questionnaire indicate that many engineers are engaged in essential public work. They give generously, quietly and efficiently of their time, talent and professional abilities for the benefit of the public welfare.

A study of the replies shows that engineers, although perhaps "keeping their light under a bushel," nevertheless are participating in the following activities:

Mayors of Towns
Commissioners of Departments
Boards of Trustees
Planning Boards
Investigating Committees
Boards of Sanitation
Civil Defense Councils
Police Athletic Leagues
Boards of Education
Budget Committees
Air Pollution Committees
Boards of Elections
Boards of Health
Community Chests
School Boards
Cancer Committees
Welfare Committees
Deacons of Churches
Boy Scouts
YMCA and PTA
Family Services
Rotary Clubs
Fraternal Organizations
Red Cross
Hospitals
Fund-raising Committees

The survey proves conclusively that engineers take a great interest in civic affairs; that they actively participate in community activities, and it fol-

(*Continued on page 45*)

STRICTLY BUSINESS

Personalities . . . **Rodney D. Chipp** of Upper Montclair, N. J., has been appointed director of engineering for all manufacturing divisions of **Allen B. Du Mont Laboratories, Inc.,** Clifton, N. J., according to an announcement by **William H. Kelley,** vice president and general manager. . . . **B. A. Daley** has been promoted to chief engineer of the Defense Division of **Servel, Inc.,** Evansville, Ind., according to **John N. Davidson,** manager of defense production. . . . **Frank F. Elliott** has succeeded **John L. Holloway** as president of **Crane Co.,** Chicago. . . . **William P. Drake,** formerly executive vice president, succeeds **George B. Beitzel** as president of the **Pennsylvania Salt Manufacturing Company,** Philadelphia, effective July 1. . . . **T. Cortlandt Williams** has been elected president of **Stone & Webster Engineering Corporation,** succeeding **Russell T. Branch** who becomes chairman of the board. . . . **F. C. Gardner,** president of **Ebasco Services Incorporated,** New York, has announced the appointment of **William G. Lauffer** as head of the Mechanical Plant Betterment Group of the Consulting Engineering Department.

Mr. Chipp

Cletus J. Oster has been appointed plant superintendent of the **Farr Company,** Los Angeles manufacturer of air filters and related equipment, according to **R. B. Esselman,** vice president. . . . **C. W. Onan,** president of **D. W. Onan & Sons Inc.,** Minneapolis, has announced the appointment of **James C. Hoiby** as vice president in charge of engineering. . . . **R. L. Troxell** has been elected a vice president of the **American-Marietta Company,** Chicago, and will continue in administrative charge of the Engineering Department where he has been chief engineer. . . . **Andrew H. Bergeson,** consulting engineer in the Washington office of the **Stromberg-Carlson Company,** Rochester, N. Y., has been elected vice president-engineering, according to **Robert C. Tait,** president. . . . **Pitney-Bowes, Inc.,** Stamford, Conn., has announced that **William F. Bernart** has been elected to the new office of senior vice president and placed in charge of a new engineering division; **John H. Pratt, Jr.** has been elected administrative vice president, also a new office; and **Frederick T. Allen** has been elected vice president for manufacturing.

Mr. Hoiby

Operational Expansion . . . **Allstates Engineering Company,** with general offices in Trenton, N. J., is extending its engineering and drafting services to the New England area and announces the appointment of **Victor G. Morgen** as manager of its new Boston Division office located at 830 Saratoga St., East Boston, Mass. . . . **Fischer & Porter Company,** Hatboro, Pa., has established a new Municipal Division to offer officials of city waterworks and sewage plants the research, engineering and sales services maintained by the instrument firm. **George W. Gard** has been named manager of the new division, which will have its headquarters in Shaker Heights, Cleveland, O. . . . A change of address to 4711 W. North Avenue, Chicago 39, Ill., is the first step in manufacturing expansion reported by **Soiltest Incorporated,** firm supplying apparatus for engineering tests of soils, asphalt, and concrete. . . . **MacAfee & Company,** Los Angeles consulting mining and chemical engineering firm, has announced a move to 3105 Wilshire Boulevard, Los Angeles 5; the move provides the firm with expanded facilities including testing laboratories.

Midwest Research Institute, Kansas City, Missouri, has announced the formation of a new Industrial Economics Division, the outgrowth of its studies in engineering economics, according to **Dr. Charles N. Kimball,** Institute president. It will operate in the areas of market research; industrial location surveys; city improvement criteria; input-output studies for industries; and other fields. It is staffed by specialists in market research, economics, management, psychology, operations research, data analysis, and chemical engineering. . . . **Arthur D. Little, Inc.,** Cambridge, Mass., industrial consulting and research firm, has announced the establishment of a new management consulting service for industrial and financial groups interested in atomic energy.

New Firms . . . **Willard W. Warzyn,** formerly chief structural engineer with **Mead and Hunt, Inc.,** Madison, Wis., has resigned to form his own firm, **Warzyn Engineering & Service Company,** also located in Madison. The new organization will do soil boring and soil sampling as a part of its specialized work in foundation and structural engineering. . . . **Vern E. Alden Company,** Chicago engineering firm, has formed a new organization in Venezuela for the purpose of doing engineering and construction work in South America. The name of the new firm is **Vern E. Alden Engineering and Construction Company of Venezuela, C. A. G. W. Young** has been named general manager and **A. H. Chamberlain,** superintendent, of the new firm. . . . The firm of **Gellert, Griffin, Carey & Associates** has been organized in Seattle, Washington, as a joint venture of five groups of engineers together with independent associates to offer a wide variety of engineering services in the Pacific Northwest. Principals in the new concern are: **N. Henry Gellert, DeWitt Griffin, James W. Carey, Harrison W. Kramer** and **Wayne Harrigan;** also included are **Paul H. Isaac, George R. Hammond** and **William P. Collier.**

Mr. Warzyn

With Our Members . . .

Annual Meetings

Indiana And Michigan Societies Hear Shoch and Other Outstanding Speakers

Retiring NSPE President Clarence T. Shoch was one of the featured speakers at the recent annual meetings of both the Indiana and Michigan Societies.

The Indiana SPE convention, held in mid-May at the Hotel Severin in Indianapolis was also highlighted by an address by the Hon. Alex M. Clark, Mayor of the City, and a speech by Roger D. Branigin. L. E. Easley, NSPE national director, acted as toastmaster for the luncheon at which Mayor Clark and President Shoch spoke; while C. F. Falkner, ISPE vice president, served as toastmaster for the banquet which featured Mr. Branigin's address, as well as award presentations and entertainment by the Indiana Bell Telephone Chorus.

Indiana President J. R. Swanton presided at the business and professional sessions, and a number of local industries cooperated in sponsoring social events.

C. F. Falkner served as chairman of the Convention Committee, with Mrs. T. G. Patterson as assistant chairman. Other members were C. F. Moss, C. E. Condra, A. L. Ulmer, and D. Stallings. Mrs. C. F. Falkner headed the Ladies Committee, assisted by Mrs. L. E. Easley.

At the Michigan Society Meeting, June 9-11 at the Gratiot Inn, Port Huron, President Shoch gave both a report on the NSPE Annual Meeting during one of the professional sessions and a major address at the June 9th dinner. Other speakers were: Col. Arthur C. Nauman, district engineer, U. S. Corps of Engineers, who spoke on *The Corps of Engineers in the State of Michigan;* D. B. Steinman, who made a progress report on the Mackinac Bridge; Orville Johnston, assistant generation engineer, Hydro-Electric Power Commission of Ontario, who spoke on *Power Development on the Niagara River;* and MSPE President Wesley Bintz.

The meeting also featured a symposium on the problems of young engineers and a tour of industrial plants in the Sarnia and Port Huron areas. There was a special program for the ladies. Also, the distinguished guests included a delegation of Canadian engineers headed by R. E. Heartz, new president of the Engineering Institute of Canada.

Both the Michigan and Indiana Society meetings featured the introduction and installation of new officers for the coming year.

Next Month . . .

Look for the third article in the *"A+ for Achievement"* series, in which leading engineering educators are reporting on the working successes of outstanding former students exclusively for the AMERICAN ENGINEER.

Erie County Installs New Officers

Louis J. Sforzini, second vice president of the New York State SPE, presided at the installation of the new officers of the Erie County Chapter at a dinner meeting held recently at the Hotel Buffalo. The new officers are: Paul E. Mohn, president; Earl A. Schilt, first vice president; Clair O. Dean, second vice president; B. Roy Ertell, corresponding secretary; Edward J. Greenan, Jr., recording secretary; Richard C. Wohler, treasurer; and Frederick W. Crane and William R. Trautman, directors.

The evening was also the occasion of the chapter's annual Ladies' Night Meeting. Another feature of the program was the presentation of an engraved silver serving tray to retiring President Franklin S. Helfter.

Speaker for the evening was Ralph Black, business manager of the Buffalo Philharmonic Orchestra, whose talk was entitled *Backstage with the Philharmonic.*

Certificates Awarded In Lake County, Ill.

Two newly-licensed engineers — William Horner and William Koepsal — received their registration certificates recently at a dinner meeting of the Lake County Chapter of the Illinois Society of Professional Engineers. The event marked the first time that such a presentation had been held officially during a chapter meeting.

Gulf Coast Chapter Hits Union Plans

In answer to recent American Federation of Labor efforts to organize professional engineers and other technical men within the area of the Gulf Coast Chapter of the Texas Society of Professional Engineers, the chapter sponsored a special meeting on June 9 devoted to the theme, *The Future Course of the Scientific and Technical Profession.*

The first portion of the meeting, which was attended by approximately 70 professional men from the area, featured a discussion of the destructive consequences of unionization in a profession. The second half dealt with means by which the professions can be strengthened.

Principal speaker for the occasion was J. B. Dannenbaum, vice president of the Texas SPE, who had previously written a letter to the technical men in the area stating the Society's position with regard to unionization.

"Our Society," Mr. Dannenbaum wrote in part, "believes that the regimentation fundamentally inherent in unionization is incompatible with the individual responsibility and independent judgment required of a professional man. We dare not be the captive of any group.

"Your work and my work is essentially creative, predominantly intellectual and varied in character, involving consistent exercise of discretion and judgment. . . .

"The unionization of the technical professions would be a great leap forward in our progress toward mediocrity. Leveling by fiat unfortunately tends downward.

"Under the collective bargaining system, where would the inspiration for new ideas and plans originate? The incentive destroying creeds of the trade union would soon stifle all individual initiative. . . ."

Eastern Kansas P.E.'s Help In Guidance

A special letter of thanks has been received by the members of the Eastern Chapter of the Kansas Engineering Society from the Kansas City, Kan. YMCA, thanking the chapter members for their part in making a recent vocational guidance meeting sponsored by the YMCA a success.

The chapter has also announced plans for the holding of a joint picnic with the members of the Western Chapter of the Missouri SPE.

With the Ladies

The Ladies' Auxiliary to the Central Chapter, Arizona SPE, has elected the following officers for the 1955-56 term: Mrs. Nicholas P. Karen, president; Mrs. Hanen H. Williams, vice president; Mrs. H. C. Bigglestone, secretary; Mrs. Harold F. Hudson, treasurer; and Mrs. Ralph A. Hoffman, Mrs. Percy C. Burdick, Mrs. John T. Young, and Mrs. Carl A. Poppino, directors.

The Auxiliary to the South Piedmont Chapter of the Professional Engineers of North Carolina, now completing its third year, reports that it plans to work for a membership increase in the fall. It has also inaugurated a scholarship project for an area student of engineering at North Carolina State College in Raleigh. Social plans for the summer months have been made with the aim of financing the scholarship project; they include a benefit bridge party which was held in June and a benefit garden party scheduled for July.

New officers have been installed by the Ladies' Auxiliary to the Tulsa Chapter of the Oklahoma SPE. They are: Mrs. Jack T. Woodson, president; Mrs. Glynn C. DeHaas, first vice president; Mrs. E. A. Lyle, second vice president; Mrs. W. B. Jarzembski, third vice president; Mrs. Ray E. Carter, secretary; Mrs. Clyde A. Young, treasurer; Mrs. C. M. Gordon, Jr., parliamentarian; and Mrs. Rolla D. King, NSPE Ladies Advisory Committee representative.

California Annual Meeting

The Annual Meeting of the California Society of Professional Engineers was held early in June at the Hotel Statler in Los Angeles. Among the highlights of professional business was the report on the State Society's legislative program and also the issuance of a charter to the new San Fernando Chapter, the fourteenth in the State. The new chapter has an initial membership of twenty-five.

Among the speakers featured on the varied program were: Smith Griswold, air pollution control officer, Air Pollution Control District of Los Angeles, who discussed the control problem; Clarence A. Winder, who spoke on the Los Angeles transit problem; and Dean R. E. Vivian of the Engineering School, University of California, whose subject was *Opportunities and Responsibilities of the Engineering Profession.*

State officers for the coming year were installed during the annual banquet which climaxed the meeting.

A number of engineering exhibits were on display during the event.

City Manager Addresses P.E.'s

A. P. Hamann, San Jose city manager, was the guest speaker at the June 14th meeting of the San Jose Chapter of the California SPE. The subject of his talk was *The Engineer's Position and His Responsibility to His Community.*

The chapter is planning a field trip to the Ampex Plant, located between Redwood City and San Carlos, for its July meeting.

Farm Equipment Book In New Edition

The McGraw-Hill Book Company has just announced the publication of the fourth edition of *Farm Machinery and Equipment*, by Harris P. Smith, professor of Agricultural Engineering, Agricultural and Mechanical College of Texas. Professor Smith is a member of the Texas SPE and NSPE.

The new edition is in effect a completely new book since it has been almost entirely rewritten to bring the material up to date and to reflect the very latest developments in agricultural machinery. There are new chapters on lubrication and lubricants, hydraulic power lift controls and rubber tires for implements, tillage history and requirements, and primary tillage equipment. Also there is additional data on new developments in weed control, spraying equipment, the use of aircraft as specialized farm equipment, and developments in tractor-power equipment, which was not covered in previous editions.

Patent Procedure Is Lecture Topic

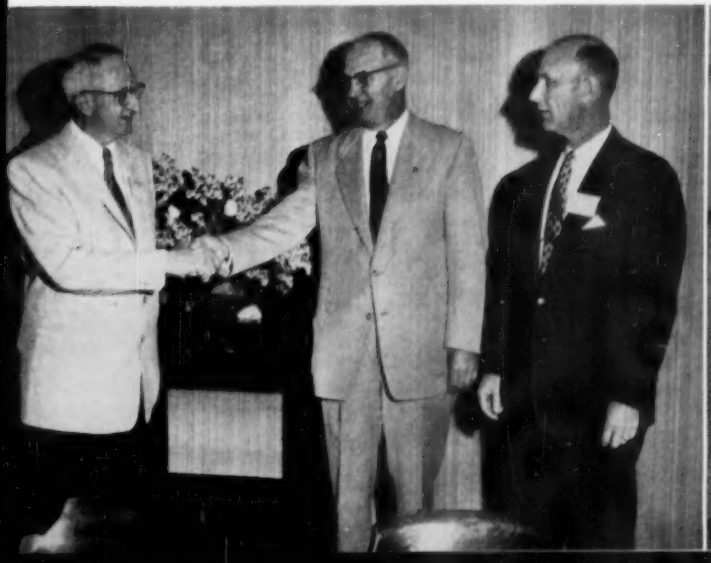
The June 23rd meeting of the Rockford Chapter of the Illinois Society of Professional Engineers featured a talk by Elmer Xanten, a local inventor. Mr. Xanten discussed technical and legal problems incident to developing and patenting inventions.

The meeting was held at the Rockford Elks Club.

. . . more news on page 39

NEW OFFICERS IN THE NEWS—The picture at the left, below, was made during a recent meeting of the board of directors of the Minnesota Society of Professional Engineers in Rochester. N. D. Adams, left, of Rochester, general chairman of the meeting is shown congratulating Arthur W. Tews of Duluth on his accession to the presidency of the MSPE, while Fred O. Reed, incoming president of the Southeast Chapter, looks on.

The photograph at the right was made during a recent installation meeting of the Appalachian Chapter of the West Virginia SPE. Left to right are: Mrs. Lloyd G. Fitzgerald; Lloyd G. Fitzgerald, incoming first vice president; Mrs. B. B. Corker; Mr. Corker, outgoing president; Paul Feigley, incoming president, and Mrs. Feigley.



PROFESSIONAL DIRECTORY

Alphabetized by States . . .

Alabama-Missouri

KIRK & COWIN

Ralph E. Kirk—Percy G. Cowin
Consulting—Appraisals—Reports
Registered Professional Engineers

One-18th Street, SW Birmingham, Alabama
Phone 56-5566

PALMER AND BAKER, INC.

Consulting Engineers — Architects

Surveys, Reports, Design, Supervision, Consultation, Traffic Problems, Tunnels, Bridges, Highways, Airports, Industrial Buildings, Waterfront & Harbor Structures, Complete Soils, Materials & Chemical Laboratories.

Mobile, Ala. **New Orleans, La.**
Harvey, Louisiana

A. W. WILLIAMS INSPECTION CO.

Mobile, Ala.
Established 1921

Inspection—Tests—Analyses
Sampling
Foundation Investigations
Representatives throughout U.S.A.
Member A.C.I.I.

KAISER ENGINEERS

Division of Henry J. Kaiser Company

ENGINEERS — CONTRACTORS

1924 Broadway, Oakland 12, California

GEORGE V. R. MULLIGAN, P.E.

Management Consultant

Operations Analysis
Manpower Utilization
Management Controls

601-19th Street, N.W. **Washington, D. C.**

SOUTH FLORIDA TEST SERVICE

Testing—Inspection—Research—Engineers

Consultants and specialists in corrosion, weathering and sunlight testing.

4301 N.W. 7th Street **Miami 34, Florida**

Member A. C. I. I.

LAW—BARROW—AGEE LABORATORIES, INC.

Foundation
Investigations

Physical & Chemical Testing

Main Laboratories: Atlanta, Ga.
Charlotte, N. C., Albany, Ga., Tampa, Fla.

MERRITT & WELKER

Engineers

Water Systems — Natural Gas Systems
Sewer Systems — Streets & Roads

Marietta, Georgia

ROBERT AND COMPANY ASSOCIATES

Consulting and Designing Engineers

Industrial Plants—Municipal, Highway and Airport Improvements — Power Plants — Water Supply — Sewage and Industrial Waste Disposal — Appraisals — Reports.

Atlanta **Georgia**

C. L. CALKINS

Professional Engineer

Mechanical and Electrical Engineering
Since 1916
Designing and Development of Special Machinery—Research—Reports—Tests
Layouts—Plans and Specifications
Illinois Registration

644 Lorraine Avenue **Waukegan, Illinois**
Telephone MAjestic 3-1090

CONSOER, TOWNSEND and ASSOCIATES

Water Supply, Sewerage, Flood Control and Drainage, Bridges, Express Highways, Paving, Power Plant, Appraisals, Reports, Traffic Studies, Airports
Gas & Electric Transmission Lines

351 E. Ohio St., Chicago 11, Illinois
9½ N. Indiana St., Greencastle, Ind.

CRESCENT ENGINEERING COMPANY, INC.

Contracting & Consulting Electrical Engineers

Design, Supervision and Construction
Process Power and Lighting for Industrial Plants

6455 S. Central Avenue, Chicago 38, Illinois

DeLEUW, CATHER & COMPANY

Consulting Engineers

Transportation, Public Transit and Traffic Problems
Industrial Plants, Grade Separations, Railroads, Subways, Power Plants, Expressways, Tunnels, Municipal Works

150 N. Wacker Drive **79 McAllister St.**
Chicago 6 **San Francisco 2**

LOUIS J. LUCAS

Industrial Management Engineer

Production — Sales — Administration

1055 Granville Avenue
Chicago 40, Illinois

PAUL BERG

Consulting Engineer

Specializing in Feed Milling and Grain Elevators
Registered Ten States

130½ E. Wayne St. **Phone E-7558**
FORT WAYNE, IND.

WILSON & COMPANY

ENGINEERS

Salina, Kansas
Albuquerque, New Mexico
Denver, Colorado

EUSTIS ENGINEERING COMPANY

FOUNDATION AND SOIL MECHANICS INVESTIGATIONS
Soil Borings—Laboratory Tests
Foundation Analyses—Reports

3635 Airline Highway
New Orleans 20, La.

WHITMAN, REQUARDT & ASSOCIATES

Engineers — Consultants

Civil—Sanitary—Structural
Mechanical—Electrical
Reports, Plans Supervision, Appraisals

1304 St. Paul Street, Baltimore 2, Maryland

ROGER BARRETT BROSS

Registered Professional Engineer

Special Electric Motors & Drives
Electromagnetic Devices
Design & Development
Testing & Consulting

25 Curtis Road **Natick, Mass.**

FAY, SPOFFORD & THORNDIKE

Engineers

John Ayer — Ralph W. Horne
Bion A. Bowman — William L. Hyland
Carroll A. Farwell — Frank L. Lincoln
Howard J. Williams

Airports, Bridges, Turnpikes
Water Supply, Sewerage, Drainage
Port and Terminal Works
Industrial Building

Boston **New York**

METCALF & EDDY

Engineers

Water, Sewage, Drainage, Refuse and Industrial Wastes Problems
Airfields — Valuations
Laboratory

Statler Building **Boston 16, Mass.**

COMMONWEALTH ASSOCIATES INC.

Consulting and Design Engineers

Power Generation
Electric—Gas—Water Systems
Industrial Planning

252 W. Cortland St. **Jackson, Michigan**

ORRIN E. FENN

Industrial Engineering and Manufacturing
CONSULTING DESIGN

METAL FABRICATION
SPRAY BOOTHS INDUSTRIAL OVENS
PARTS WASHERS DUST COLLECTORS

MT. CLEMENS, MICH

THE HINCHMAN CORPORATION

Consulting Engineers

CORROSION CONTROL—Surveys, Reports, Design, Specifications, Evaluation
UNDERGROUND UTILITIES — Location, Mapping, leakage surveys, electrical grounding systems
HOLLOW PILING—Directional Surveys by electronics

Francis Palms Building **Detroit 1, Mich.**

BETTENBURG, TOWNSEND & STOLTE

Registered Professional Engineers

A complete professional service

1427 Marshall Ave., St. Paul 4, Minn.
Tel.: NEstor 6191

BLACK & VEATCH

Consulting Engineers

Water—Sewage—Electricity—Industry
Reports, Design
Supervision of Construction
Investigations, Valuation and Rates

4706 Broadway, Kansas City 2, Mo.

J. Z. JIZBA
Civil Engineer & Architect
Bridges, Buildings, Drainage, Highways
Design, Surveys, Supervision
5417 Ogden Street — Omaha 4, Nebraska

GREER & McCLELLAND
Consulting Engineers
FOUNDATION
INVESTIGATIONS
98 Greenwood Ave. — Montclair, N. J.
2649 N. Main St. — Houston, Texas

FRANK E. HARLEY AND ASSOCIATES
Water Works, Sewage, Municipal
Highways
Harley Building
360 Godwin Avenue — Wyckoff, N. J.

UNITED STATES TESTING COMPANY, INC.
Engineering Testing and Inspection
Development—Research—Consulting
Soils • Concrete • Steel • Welding
Pipe • Brick • Tile
Main Laboratories: Hoboken, New Jersey
Boston, Denver, Chicago, Dallas, Memphis, New York, Wilmington, Philadelphia, Providence, Los Angeles

BROWN & BLAUVELT
Industrial Plants, Bridges, Dams, Airports, Expressways, Parkways, Highways, Preliminary Reports, Engineering Design, Construction Supervision, Material Controls and Testing, Municipal Engineering Services, Tax Maps, Surveying
468 Fourth Avenue — New York 16, N. Y.

FOSTER & CAFARELLI
Engineers
Port Development, Shipyards, Drydocks, Power Plants, Distribution Systems, Industrial Plants, Commercial Buildings, Surveys, Reports, Estimates, Design, Supervision, Consultation.
44 Whitehall Street, New York 4, New York

HARDESTY & HANOVER
Consulting Engineers
Bridges—Long Spans of All Types
Movable—Lift, Bascule and Swing
Hanover Skew Bascule, Steel and Concrete Spans
Grade Crossing Eliminations
Expressways and Thruways
Other Structures, Foundations
Supervision, Reports, Appraisals
101 Park Avenue, New York 17, N. Y.

FREDERIC R. HARRIS, INC.
Consulting Engineers
Harbors, Piers & Bulkheads, Drydocks, Foundations, Soil Mechanics, Sanitary & Industrial Waste Disposal, Airports, Highways, Bridges
27 William Street — New York 5, N. Y.

PROFESSIONAL DIRECTORY

Alphabetized by States . . .
Nebraska-New York

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
Consulting Engineers
Bridges and Structures
Foundations, Highways
Administrative Services
1805 Grand Ave. — Kansas City 8, Mo.
55 Liberty St. — New York 5, N. Y.

MADIGAN-HYLAND
Consulting Engineers
28-04 41st Avenue
Long Island City, New York

JAMES P. O'DONNELL
Engineers
39 Broadway — New York 6, N. Y.
Bowie Building — Beaumont, Texas

Restricted to Registered Professional Engineers . . . Directory Continued on Next Page

McDonnell Heads North Shore P.E.'s

J. A. McDonnell will be president of the North Shore Chapter of the Massachusetts Society of Professional Engineers, according to an announcement made during the group's recent annual meeting. Other newly-elected officers are: H. G. Crabtree, vice president; E. F. Hansen, secretary; P. H. Wilson, treasurer; W. D. Bartlett, membership secretary; and G. A. Ross and H. M. King, directors. Immediate past president of the chapter is L. W. Burton.

The evening's program was devoted to a panel discussion on the subject, *Our Professional Problems and Plans for the Future*. The basis for discussion was found in the new NSPE publication, *A Professional Look at the Engineer in Industry*.

Dean Cudworth Addresses Birmingham P.E.'s

James R. Cudworth, dean of the College of Engineering, University of Alabama, was the featured speaker at a recent dinner meeting sponsored by the Birmingham District Chapter of the Alabama Society of Professional Engineers. Dean Cudworth, who is also chairman of the Student Guidance Committee of the Engineering Council for Professional Development, spoke on *The Need for Engineers and Its Impact on the Colleges*.

The meeting was held at the Bankhead Hotel in Birmingham.

. . . more news on page 11

ENGINEER OF THE YEAR—The photo at the right shows E. D. Sibley, vice president of Gilbert Associates, Inc., Reading, Pa., receiving the first annual "Engineer of the Year" award to be sponsored by the Reading Chapter of the PSPE. K. Raymond Titlow (far right), retiring president of the Reading Chapter, is making the presentation, while Harry E. Potteiger (center), the incoming president looks on. Mr. Sibley is also a past president of the chapter.

PROFESSIONAL DIRECTORY

Alphabetized by States . . .

New York-Pennsylvania

PARSONS, BRINCKERHOFF, HALL & MACDONALD

Engineers

Bridges, Highways, Tunnels, Airports, **Subways**, Harbor Works, Dams, Canals, **Traffic**, Parking and Transportation Reports, Power, Industrial Buildings, Housing, Sewerage and Water Supply.

51 Broadway, New York 6, N. Y.

SEELYE STEVENSON VALUE & KNECHT

Consulting Engineers

Richard E. Dougherty, Consultant

Airports, Highways, Bridges, Dams, Water Supply, Sanitation, Tunnels, Industrial Plants, Concrete, Steel, Industrial Waste Disposal, Foundations, Soil Studies. Civil—Mechanical—Electrical

101 Park Avenue **New York 17, N. Y.**

SINGSTAD & BAILLIE

Consulting Engineers

Ole Singstad David G. Baillie, Jr.

Tunnels, Subways, Highways
Foundations, Parking Garages
Investigations, Reports, Design
Specifications, Supervision

96 State St. **New York 4, N. Y.**

D. B. STEINMAN

Consulting Engineer

BRIDGES

Design — Construction — Investigation
Reports — Strengthening Advisory Service

127 Liberty Street **NEW YORK CITY**

SYSKA & HENNESSY, INC.

Engineers

Design, Reports, Consultation
Power Plant, Disposal Plant, Water Systems

NEW YORK, N. Y.

TIPPETTS-ABBETT McCARTHY-STRATTON

Engineers

Ports, Harbors, Flood Control, Irrigation, Power, Dams, Bridges, Tunnels, Highways, Subways, Airports, Traffic, Foundations, Water Supply, Sewerage, Reports, Design, Supervision, Consultation.

62 West 47th Street **New York City**

LEONARD M. TODD

Consulting Engineer

CHEMICAL AND INDUSTRIAL PLANTS
PROCESS SURVEYS PATENT REPORTS

24 Fifth Avenue **New York 11, N. Y.**
GRamercy 3-6400

New York — Washington — St. Louis — Oklahoma City

ADACHE & CASE, ENGINEERS

The Arcade **Cleveland 14, Ohio**

Aircraft Turbo-Jet Laboratories
Minus 100° to Plus 1000°
400° High Temperature Hot Water District Heating

ELMER S. BARRETT ASSOCIATES

Consulting Engineers

Surveys—Design—Inspection
Highways — Municipal
Bridges — Reports
Transmission Lines

249 S. Paint St. **Chillicothe, Ohio**
Phone: 34600

E. D. BARSTOW & ASSOCIATES

E. D. Barstow—T. A. Gilliam

Water Supply, Sewerage,
Highways, Structures, Industrial

163 N. Union Street **Akron 4, Ohio**

GEORGE W. BRANDT, ENGINEER

Consulting • Design •

Mechanical • Development • Fabrication

Box 101 **West Milton, Ohio**

GUSTAVE M. GOLDSMITH

Consulting Engineer

General Structures — Plant Layout
Design—Investigation—Quantity Surveys

1734 Bella Vista **Cincinnati 37, Ohio**

EMMET J. McDONALD

CIVIL ENGINEER

HIGHWAYS, MUNICIPAL, SURVEYS

337 Rhodes Avenue **Akron 2, Ohio**

THE H. C. NUTTING COMPANY

Engineers and Chemists

Foundation Investigations
Core Drilling
Water and Waste Surveys
Complete Testing Service

4120 Airport Road, Cincinnati 26, Ohio
2145 N. W. 2nd Ave., Miami 37, Florida

TOLEDO TESTING LABORATORY

Engineers and Chemists

Concrete — Soils — Asphalt
Inspection — Tests — Supervision
Consultation — Specifications and Investigation of
Engineering Works and Materials

1810 North 12th St. **Toledo 2, Ohio**

OKLAHOMA TESTING LABORATORIES

Registered Engineers—Chemists

Oklahoma City, Okla.

Materials Testing and Inspection

Member A. C. I. L.

C. A. Lashbrook — **Owner-Director**
M. A. Witte — **Chief Engineer**

ALBRIGHT & FRIEL, INC.

Consulting Engineers

COMPLETE ENGINEERING SERVICE

Including Design and Supervision of Construction
Water, Sewage and Industrial Wastes Problems
Airfields, Refuse Incinerators, Dams
Power Plants, Flood Control, Industrial Buildings
City Planning, Reports, Appraisals and Rates
Laboratory For Chemical & Bacteriological Analyses

121 South Broad St., Philadelphia 7, Pa.

ARK ENGINEERING COMPANY

Consulting Electronic Engineering

Radio Interference Measurements and Control
F.C.C. Equipment Certification
Electronic Development—Technical Writing

431 W. Tabor Road
Philadelphia 20, Pennsylvania
Phone: LIvingston 8-1545

MICHAEL BAKER, JR., INC.

Consulting Engineers

Highways, Airports, Waterworks, Sewers, Sewage Treatment, City Planning, Surveys, Photogrammetric Mapping

Baker Building—Rochester, Penna.
Branch Offices
Harrisburg, Pa. Jackson, Miss.
College Park, Maryland

CAPITOL ENGINEERING CORPORATION

Engineers—Constructors—Management

Design and Surveys — Roads and Streets
Sewer Systems — Water Works
Planning — Airports
Bridges — Turnpikes — Dams

Executive Offices: Dillsburg, Pennsylvania
Washington, D. C — **Pittsburgh, Pa.**
Dallas, Texas — **Paris, France**

FRAZIER-SIMPLEX, INC.

CONTRACTING & CONSULTING ENGINEERS

Furnace Engineering for the Glass and Steel Industries

436 East Beau Street, WASHINGTON, PA.
U. S. A.

GANNETT FLEMING CORDDRY & CARPENTER, INC.

Engineers

Water, Sewage, Roads, Turnpikes
Bridges, Airports, Traffic, Appraisals.

HARRISBURG, PA.

Philadelphia, Pa. — **Daytona Beach, Fla.**
Pittsburgh, Pa. — **Medellin, Columbia, S.A.**

GREEN ENGINEERING COMPANY

Consulting Engineers

Highways, Bridges, Buildings,
Industrial Plants

Pittsburgh, Pa.

Philadelphia, Pa. — **Baltimore, Md.**
Boston, Mass. — **Washington, D. C.**
Chicago, Ill. — **Miami, Florida**

HALL LABORATORIES, INC.

Consultants on Industrial Water Problems

Boiler Water Conditioning, Cooling
Water Treatment, Process and
Waste Water Engineering Service

P. O. Box 1346 **Pittsburgh 30, Pa.**
(323 Fourth Ave.)

THE KULJIAN CORPORATION

Engineers • Constructors • Consultants

POWER PLANTS
(Steam, Hydro, Diesel)
Oil Refineries, Pipe Lines • Chemical Plants • Textile Plants • Breweries, Food Processing Plants • Airports, Hangars Army, Navy Installations

1200 No. Broad St., Philadelphia 21, Pa.

LAWRIE & GREEN & ASSOCIATES

Architectural and Engineering Offices

321 N. Front Street
Harrisburg, Pennsylvania

Ritchie Lawrie, Jr., P.E., Consulting Engineer

MODJESKI AND MASTERS
Consulting Engineers

G. H. Randall, C. W. Hanson, F. M. Masters, J. E. Glose, H. J. Engel

Design and Supervision of Construction
Inspection and Reports
Bridges, Structures and Foundations

State St. Bldg. Harrisburg, Pa. — New Orleans, La. Philadelphia, Pa.

CYRUS WM. RICE & CO., INC.

Consulting Chemical Engineers
Industrial Water and Waste

16 Noble Avenue, Pittsburgh 5, Penna.

EMERSON VENABLE
Chemist and Chemical Engineer

Chemical Analysis
Research — Development
Trouble Shooting

6111 Fifth Ave., Pittsburgh 32, Pa.

CORMIT ENGINEERING COMPANY
Marshal E. Parker, P.E.
CORROSION — CATHODIC PROTECTION
Surveys, Reports, Design, Specifications
Coating Inspection
UNDERGROUND PIPING WATER TANKS, OFFSHORE PLATFORMS, BARGES, PILING

M & M Building, No. 1 Main Street, Houston 2, Texas — Phone FAirfax 9953

THOMAS E. DUCE ASSOCIATES
Consulting Engineers

Electrical and Mechanical
Murray Building
1733 S. Brownlee Blvd., Corpus Christi, Tex.

ENGINEERS TESTING LABORATORY, INC.
FOUNDATION AND SOIL MECHANICS INVESTIGATIONS

Soil Borings, Foundation Analyses — Laboratory Tests, Reports

3313 Main Street — Houston, Texas

FORREST and COTTON
CONSULTING ENGINEERS

Regional Water Supplies
Water and Sewage Works
Industrial Development
Airports — Dams
Appraisals — Reports

803 Praetorian Building — Dallas 1, Texas

FREESE & NICHOLS
Consulting Engineers

407-410 Danciger Bldg.
Fort Worth 2, Texas

PROFESSIONAL DIRECTORY

Alphabetized by States . . .
Pennsylvania-Virginia

LOCKWOOD & ANDREWS
Consulting Engineers

Water Works, Sewerage & Sewage Disposal, Public Works, Structures, Earthworks, Mechanical & Electrical.

Reports—Design—Supervision
Surveys—Valuations

Corpus Christi—Houston—Victoria, Texas

HARRY L. TOOKER & ASSOCIATES
Architectural & Structural Engineers

Pasadena Oaks Professional Building
Pasadena, Texas

WILTON SMITH WHIPP
Civil Engineer and Land Surveyor

3214 West Broadway — Hopewell, Virginia
Phone: 2019

Restricted to Registered Professional Engineers . . . Directory Continued on Next Page

J. L. Young Named "Engineer Of Year"

The Beaver County Chapter of the Pennsylvania Society of Professional Engineers recently awarded its "Engineer of the Year" citation to John L. Young of Brighton Township, vice president in charge of Engineering, United States Steel Corporation. The award presentation was made during the chapter's annual banquet. Michael Baker, Jr., previous recipient of the honor, gave the Engineer of the Year plaque to Mr. Young in the name of the chapter.

The honored engineer is a native of Evansville, Indiana, and a graduate of Indiana University. He is a past president of the Association of Iron and Steel Engineers and holds membership in many other technical, professional and civic groups, in addition to the PSPE.

High School Seniors Are Central Ill. Guests

Eleven seniors from Decatur High School who are interested in entering engineering courses in college were the guests of honor at a recent meeting of Central Illinois Chapter of the Illinois SPE.

Stanley H. Pierce, associate dean of the College of Engineering at the University of Illinois, was the guest speaker for the occasion, discussing *Challenges in the Creative Profession of Engineering.*

The annual math awards sponsored by the chapter were also presented during the meeting. The students receiving them were Marvin D. Heffington and Larry Bergandine.

. . . **more news on page 42**

SCIENCE FAIR AWARD—Pictured at the right, Eugene A. Balas, president of the San Diego Chapter of the California SPE, presents the chapter-sponsored trophy to David A. Smith (center), Escondido High School student who won the San Diego Science Fair's engineering award. Looking on is Leo Kennedy, young Smith's teacher. The winner's display was a seawater conversion apparatus featuring a heat transfer method.

PROFESSIONAL DIRECTORY

Alphabetized by States . . .
Virginia-West Virginia

HARRY OTIS WRIGHT, JR.
Civil Engineer & Land Surveyor
THE WRIGHT ENGINEERS
Airports, Highways, Sewerage, Waterworks, Sewage Treatment, Land Planning, Surveys, Mapping
Phone: CRescent 3-2882
Post Office Building, Fairfax, Virginia.

FERGUSON-GATES ENGINEERING CO.
Registered Professional Civil and Mining Engineers
Coal Property Reports — Valuation — Development — Plant Design — Ventilation — Dust Surveys
Allen Building, Telephone 5721 — P. O. Box 672, Beckley, W. Va.

. . . Supplemental Services . . .

EHRCO DIE CASTING SERVICE
Engineering Consultation—Die Castings
Equipment—Installation
Die and Product Design
John R. Ehrbar, P.E., Pres.
803 Main Street, Stamford, Connecticut
Telephone 3-2308

APPLIED PSYCHOLOGY CORPORATION
Specialists in man-machine problems.
Robert B. Sleight, PhD, President
515 4th St. N.W., Washington 1, D. C.

A PATENTED NON-METALLIC CONDUIT SYSTEM
For Conveying Hot or Cold Liquids, Vapors
VERSATILE—CORROSION PROOF—RELIABLE
Write
Water-Tight Underground Conduit
Engineers & Fabricators
P.O. Box 12211, Houston 17, Texas — P.O. Box 2181, Atlanta 1, Ga.

BUILDERS ESTIMATING SERVICE
COST ESTIMATES
QUANTITY SURVEYS
CONSTRUCTION ANALYSIS
MATERIAL PURCHASE LISTS
140 Nassau Street, New York 38, N. Y. — Telephone COrtland 7-0322

EASTERN HEAT TREATING & BRAZING CORP.
Precision Heat Treatment and Brazing
Induction Heat — Heli-Arc-Welding
Hydrogen Atmospheric Cycles
Affiliated Company:
EASTERN METALS INDUSTRIES, INC.
Metallic Bellows & Diaphragm Assemblies
250 West 54 Street, New York 19, N. Y.
Joseph Lipset, P.E., Pres.

KENNEDY-RIEGGER DRILLING COMPANY, INC.
Fred W. Riegger, P.E., President, Assoc. Mem. A.S.C.E.
Licensed Professional Engineers
Core Drilling Contractors
Diamond Drill and Test Borings
KIngsbridge 9-8458
5418 Post Road, New York 71, N. Y.

MANU-MINE RESEARCH & DEVELOPMENT CO.
Soil Solidification
Geological Engineering
Chemical Research
P. O. Box 167
Reading, Pennsylvania

PROFESSIONAL ENGINEERS . . .
List your Card in the Professional Directory.
Rates: $6.00 per issue, twelve times basis
Simply mail your business card to
AMERICAN ENGINEER
1121 15th Street N.W., Wash. 5, D. C.

● *Consult this Directory for Qualified Specialists* ●

Summer Activities

Among the summer activities scheduled by the various chapters and state societies affiliated with NSPE are many outings, picnics, golf parties, dances, and so on. One of those which has already been held was the annual summer outing of the Georgia SPE at the General Oglethorpe Hotel in Savannah, June 16-18. With the hotel as headquarters, the P.E.'s and their wives pursued a busy program of sports, boating, picnicking, and dancing in the Savannah area.

Other summer social events that have already become history were the annual picnic of the St. Louis Chapter of the Missouri SPE, held June 18 at the Lion's Club Picnic Grounds in Valley Park, and the dinner dance of the Maumee Valley Chapter of the Ohio Society, held in Lima on June 3.

Mahoning Valley P.E.'s of the Ohio Society have scheduled their annual fish fry for July 9, and are planning a stag picnic and golf tournament for August.

Have you checked these in the Classified section?

- **Business Opportunities**
- **Help Wanted**
- **Positions Wanted**
- **Training Courses**

Check Classified, page 47.

Illinois P.E.'s Hold Legislative Dinner

The third biennial legislative dinner sponsored by the Illinois SPE was held recently in Springfield, Illinois, at the Elks Club. Approximately 400 engineers and their guests attended the event for which Clarence Klassen served as toastmaster.

Seated at the speakers table were Lieutenant Governor John W. Chapman, Speaker of the House Warren L. Wood, Secretary of State Charles Carpentier, NSPE Vice President Louis F. Frazza, ISPE Vice President Royce Johnson, Civil Defense Director Col. Komer, Representative Charles K. Willet, Dean William L. Everitt, ISPE President Dwain Wallace, and Representative C. G. Hall who gave the invocation.

A large Chicago delegation attended headed by NSPE Vice President Virgil Gunlock, Public Works Director George L. DeMent, and Chicago Chapter President Harold Sommerschield.

L. Ryburn was chairman of the committee that planned the dinner, assisted by William Russell, M. R. Golly, Richard Nankivil, W. W. Worsham, G. E. Rynearson, and J. P. Murphy.

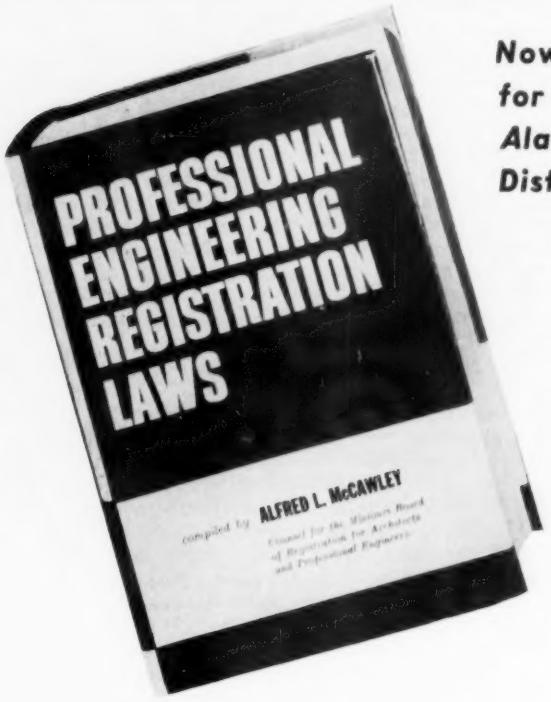
St. Lawrence Seaway Is Meeting Topic

A recent joint meeting of the New York Chapter of the New York State Society of Professional Engineers and the New York District of the American Society for Testing Materials was devoted to the St. Lawrence Seaway development plans. J. Burch McMorran, chief engineer, Power Authority of the State of New York, was the featured speaker, discussing *Engineering Aspects of the St. Lawrence Seaway and International Power Project.*

PR Lecture In St. Louis

Joseph P. Sestric, director of public safety for the City of St. Louis, was the guest speaker at a recent meeting of the St. Louis Chapter of the Missouri SPE. The subject of his address was *Public Relations in a Public Office.*

A PROFESSIONAL BEST SELLER!



Now, a Compendium of Registration Laws for Professional Engineers in all 48 States, Alaska, Hawaii, Puerto Rico, and the District of Columbia.

This is a book that belongs on the shelf of every professional engineer's reference library or in the hands of the student engineer. Compiled by a recognized authority in the field of professional registration, the book presents, state by state, the exact legal requirements that must be met for professional practice. The unique volume covers in detail such elements of the state laws as temporary permits, fees and bonds, the filing of maps, certificate applications, education requirements, examinations, and public works projects. The laws are cited for reciprocity, registration renewals, corporate and partnership practice, revocation of registration, and violations and penalties.

Only a Large Printing Has Kept Cost Low

ONLY $8.75

This durably-bound volume, printed in easy-to-read type, is a bargain at $8.75. Here is a book you will use for years as an "always-ready" reference work. Remember, this project is a non-profit venture backed by the National Society of Professional Engineers as a service to the profession. *Order your copy today for your own use or as an excellent gift for a professional colleague or student friend.*

WHAT REVIEWERS HAVE SAID...

"The compiler of this book, A. L. McCawley, is peculiarly well fitted for the task. A wide knowledge obtained over many years' study of the laws of other states, comparing them with the similar laws of his own state, and applying this knowledge to the preparation of bills introduced into the Missouri Legislature has been applied in the preparation of this compendium. The volume of 514 pages comprises an excellent reference source on all legal phases of registration."

Engineering Digest,
Toronto, Ontario

"The 614-page book is the culmination of an extensive research project undertaken by McCawley under the sponsorship of the National Society of Professional Engineers. A valuable addition to any engineer's library."

Architect and Engineer

"It is a reference volume designed for the professional engineer or the engineer-in-training who plans to practice on a permanent or part time basis in another state or territory."

Journal of the American Society for Engineering Education

The Author

Alfred L. McCawley, a Missouri State Senator for many years, is the author of numerous published articles on professional registration for engineers and architects. A sponsor of the Missouri securities law, he is counsel for that State's Board of Registration for Architects and Professional Engineers. His legal career dates back to 1900, when he was admitted to the Missouri Bar.

ORDER THIS "FIRST BOOK OF ITS KIND" TODAY, FOR YOUR OWN USE OR AS AN EXCELLENT GIFT!

A. L. McCAWLEY
Trustee, Publications Fund
Box 474
Jefferson City, Missouri

Dear Sir:

I enclose (check) (money order) in the amount of $..... for..... cop ..... of *Professional Engineering Registration Laws*. Ship to *(please print)*:

Name .....

Street .....

City ..... *State* .....

(Make checks payable to: A. L. McCawley, Trustee, Publications Fund)

book looks

The Book: **Engineers' Dreams**

The Author: **Willy Ley**

The Publisher: **The Viking Press, 18 E. 48th Street, New York 17, N. Y.**
Price: **$3.50**

Reviewing the Book: **W. Earl Christian, P. E., Chief Engineer, Hefler-Snyder Co. of Garwood, N. J., and NSPE National Director**

When an engineer is requested to review a book, it is easy to assume he is a little out of his element. Because of his training he first tries to analyze the new problem with which he is faced. What is the function of the "book reviewer" and what is the purpose of the resulting "review?" Obviously, it is usually intended to inform the reader of the book's contents, purpose, and other phases, briefly, so that the reader may determine its potential for purchase. He may want it as a gift, or for his own library. It seems quite obvious, also, that there is, or should be, a distinction between reviews of works of fiction and works of scientific interest.

The title of this book could almost as well be *Engineers Dream*. They do. It is the nature of the beast. The elimination of one apostrophe and one *S* creates a statement of fact, a complete sentence in two words. The dreams mentioned in this book are most certainly not of the cosmic variety. Nor are they subject to interpretation by a psychiatrist.

A. A. Berle, Jr., is quoted as saying recently, "Great ideas need landing gear as well as wings." The dreams reported by Mr. Ley come pretty close to meeting Mr. Berle's specification. They are very real, very characteristic of the dreams of many engineers. That they have not gone beyond the dream stage is generally more because of international political considerations and economic obstacles than because of insuperable physical hurdles.

Actually, some of the potential projects described in this volume, have or soon will emerge from the ethereal into reality.

There is not sufficient space here even to condense all of the engineers' dreams described. They include the tunnel under the English Channel, plans for which have been studied for more than one hundred and fifty years. This project once even reached the construction stage. Work was started in the 1880's, at both ends, then abandoned.

The book describes the Armstrong "Seadrome," designed by Edward R. Armstrong, an American engineer, and other so-called "Islands Afloat." The necessity for these, of course, no longer exists, since advances in aviation have made non-stop trans-ocean flying routine. However, a variation of the Armstrong idea is very much in the news today. Off-shore installations are to be constructed and installed to permanently house radar detection equipment as a defensive measure.

Most of the other chapters in the book direct their attention to man's unceasing efforts to find suitable substitutes for our not inexhaustible "fossil" fuel supply. These chapters cover many possible ways and means of converting natural forces to energy and power. They include the harnessing of heat from the earth and the bottom of the sea; water power; solar energy; and the tides and waves of the oceans.

While motion is made of atomic power, very little space is devoted to this subject, which may, within a generation, relegate many of the dreams to the realm of forgotten dreams.

One chapter is devoted to the potential of the Valley of the Jordan for development of hydro-electric power and irrigation. Sufficient study, according to the author, has been made so that the one remaining obstacle is in the political category. However, under date of February 7, a news item reported that Eric A. Johnston, President Eisenhower's special envoy, has reached an "understanding" with Jordan, Syria and Lebanon on the general principles of a plan for "exploiting the waters of the Jordan River for the mutual benefit of Israel and its Arab neighbors."

Such developments prove that any publication with a background of engineering or science, is up to date only as of the day the manuscript was completed.

The book itself is, in the opinion of this reader, well written. It makes interesting reading. A very extensive amount of research is indicated. It is not so technical that a layman would have difficulty understanding the reasoning underlying the many potential projects.

It was a little astonishing to read in the New York *Herald-Tribune* Sunday Book Review Section of January 9, the following, under "Science and Fantasy," by H. H. Holmes: "Oddly, three of the year's most rewarding books were published as *juveniles*, but are here urgently called to the attention of adult readers: . . . [one is] Willy Ley's absorbing and stimulating non-fiction essays, *Engineers' Dreams*."

It is difficult to understand how anyone could classify this effort under "juvenile," unless the youth of today is much more knowledgeable science-wise, than we have been led to believe.

Altogether, it is stimulating and thought-provoking to anyone with an engineering or scientific background. One can only conclude, after reading this book, that pioneering does not need geographical frontiers. We shall always have pioneers with scientific frontiers in this wonderful world we live in.

The author concludes with an expression to which this reader certainly subscribes, to the effect that probably man's greatest "natural resource" is "man's own ingenuity."

This book demonstrates pretty thoroughly that when engineers dream, they usually first assure themselves that their "ideas are equipped with landing gear as well as wings."—***End.***

Meet the Reviewer . . .

Mr. Christian

W. Earl Christian was born in Trenton, New Jersey, January 27, 1898. He studied at the University of Illinois, 1916 to 1918, and served with the Army Engineers in World War I. During the past twenty years he has been in the contracting, construction and paving business. Mr. Christian is presently associated with the Hefler-Snyder Company of Garwood, New Jersey, producers of Bituminous Paving Materials and General Contractors, as Chief Engineer.

He is Chairman of the Zoning Board of Adjustment in his home community, President of the New Jersey Bituminous Concrete Association, and a Member of ASCE. He is a former President of the Raritan Valley Society of Professional Engineers, former Trustee of the New Jersey SPE, National Director of NSPE, from New Jersey for three years. He is serving his second year as Chairman of NSPE Constitution and Bylaws Committee, and was recently elected a Vice President of New Jersey SPE.

Postscripts

(*Continued from page 34*)

lows that every effort should be made to obtain further information concerning such activities, and to encourage engineers in such work. The political and civic work of Federal, State and City Governments requires the practical thinking and fact-finding abilities of engineers. For example, appropriations for public welfare projects and for governmental expenditures should be subject to the approval of a committee of engineers, and not left to professional politicians of partisan leanings.

The Civic Affairs Committee is now planning to actively encourage the promotion of interest in civic welfare and public affairs in high schools, colleges and in all Sections of the A.S.M.E. Cooperation with other technical societies will be furthered, along with encouragement to all engineers to participate even more actively in civic affairs. Engineers should keep our Committee apprised of their part in civic life. . . .

CONCLUSION: It is hoped that the excellent record of engineers now participating in community activities will act as an inspiration to other engineers who have been reluctant to take part in such activities. Engineers are needed. They can be of great help to community welfare, and they should take an active part in civic affairs.

Detroit Group Names New Officers

Raymond Foulkrod, chief engineer of the Michigan Bell Telephone Company, is the newly elected president of The Engineering Society of Detroit, according to a recent announcement. Other new officers of the organization are: George H. Miehls, first vice president; Kenneth R. Herman, second vice president; William H. Graves, secretary; Fred J. Walls, treasurer; and Clyde L. Palmer, assistant treasurer. Mr. Miehls and Mr. Walls are also members of the Detroit Chapter of the Michigan Society of Professional Engineers and NSPE.

Conference

(*Continued from page 15*)

Mr. Roberts' prepared address included the citing of a number of responsibilities on the part of industrial management and the individual engineer concerning the problem of professional development in industry.

On the management side, Mr. Roberts listed the responsibilities as: The creating of an atmosphere favorable to personnel development; evaluation of the individual; guidance and counsel along personnel as well as professional lines; establish a clear responsibility on the part of the individual for self-development; provide programs and educational studies that assist the individual; and assign work that will properly utilize the individual's talents to the fullest and will broaden him.

MR. ROBERTS summed up the individual's responsibilities as: Recognize and accept the necessity for planning and activating his own self-development program; seek guidance and counseling when necessary; perform to his fullest on each assigned task; recognize and discharge his responsibilities as a professional member of his organization; assist those working for or with him to the extent desirable in their own self-development program.

"Personnel development, as I visualize it," Mr. Roberts said, "is a two-way street, in which management on the one hand has its responsibilities and the individual, on the other, has his. Both must recognize and discharge these to the best of their ability if the personnel development program is to be successful."

The prepared talks were given at the morning session of the conference, which was moderated by Dr. James Creese, president of the Drexel Institute of Technology. Retiring President Shoch opened the conference.

At the conference luncheon meeting the guests heard Rep. Carroll D. Kearns, of Farrell, Pennsylvania.

"I have had a very, very personal feeling about the status of engineers," Rep. Kearns said, "since first they appeared before the Committee on Education and Labor when we were having amendments to the Taft-Hartley Law; and being a professional person myself I began to realize immediately that there have been injustices done through interpretation of language in laws that were very, very difficult to cope with."

"I think one of the great problems that we have had in the field of engineering is lack of understanding between many phases of management and the engineers," the Congressman stated.

REP. KEARNS suggested that industry should have "a promotion system which recognizes individual professional achievement." He also recommended that engineers should be encouraged to participate in outside professional activities, given assistance for advanced technical education, supported in participation of worthwhile civic activities, and afforded a physical atmosphere which stresses the individualism inherent in professional men.

Rep. Kearns predicted that "the peacetime atom will creep into industry and be developed so quickly that within the next seven to ten years our whole concept of engineering and manufacturing, application, and the type of product, will be changed so drastically that many of us won't recognize ourselves what has transpired."

Rep. Kearns advised the engineering profession to take a serious interest in the type and quality of education being given in the elementary and secondary schools. "I think in your communities as professional people you have an obligation to follow through as to what your superintendent of schools and the faculty are doing about the greatest collateral in America—our boys and girls."

"Unless we accept responsibilities like that we can't expect other people to think that we are so greatly professional as we ourselves may profess to be."

At the afternoon session the speakers participated in a panel discussion moderated by John D. Coleman, a past president of NSPE, and retiring chairman of the Professional Engineers Conference Board for Industry. During this session, at which questions from the audience were discussed, the speakers were joined by Robert A. Blackburn, chairman of the NSPE Engineer-in-Industry Committee, and Dr. G. Brooks Earnest, chairman of the Committee on Employment Conditions, Engineers Joint Council.

In his introductory remarks, Mr. Coleman outlined the origin and achievements of the PECBI, and the development of an extensive public relations program by the National Society.

The question and answer period started off with "Why don't the colleges teach engineering students something about industrial relations which affect engineering employment?"

Dean Dougherty answered by saying that in some of the colleges such courses are now being given.

With this beginning, the questions were answered and discussed by the various members of the panel. Most of the questions were directed to actual problems faced by the professional engineer who is employed in industry.—***End.***

...NEW LITERATURE...

To help the offering firms determine which literature you require, when requesting an item, be sure to list all specifications shown . . . and say you saw it in the AMERICAN ENGINEER.

MEMBRANE FILTER— A brochure which describes a new type of membrane filter for use in research, production and quality control is now offered by Millipore Filter Corp. The 35-page spiral-bound booklet gives detailed information on use of the filter in microbiological studies; public health surveys; analysis of acid mists, metals fumes and smokes; quality control in food and beverage industries; research in drugs and pharmaceuticals and other areas of application. For copy of this booklet, send request on company letterhead to Millipore Filter Corp., Watertown 72, Mass.

FIRE PROTECTION—A completely new 40-page catalog covering interior fire protection equipment for all types of buildings has been released by the Elkhart Brass Mfg. Co., Inc. Simplicity of use for cabinet specifications and accessories with line drawings and cross indexing gives the Engineers, Architects, and Contractors an outstanding reference catalog. Cabinets featured in steel, stainless steel, aluminum and bronze. Includes nozzles, standpipe equipment, extinguishers and others. Copies of the catalog will be sent upon request to Elkhart Brass Mfg. Co., Inc., 1302 West Broadway Ave., Elkhart, Ind.

—AE—

CONTROLLED VOLUME PUMPS—The new Milton Roy Bulletin 953 describes and illustrates how Controlled Volume Pumps are used in typical industrial water treating systems. Water treating processes described include coagulation systems, lime soda softening, hot process softeners, demineralization, and various types of boiler water treatment systems. Thorough analysis is given to cooling tower water treating problems and methods and systems for waste and sanitary water treatment. Copies of the 24-page Bulletin 953 are available from Milton Roy Company, Station E, 1300 East Mermaid Lane, Philadelphia 18, Pa.

—AE—

PIPING SYSTEMS—A yardstick for measuring basic cost factors in the installation of piping systems is contained in a new eight-page, illustrated booklet just published by A. M. Byers Co. Entitled "True Piping Economy", the Booklet compares wrought iron and other types of pipe in terms of the three important costs to consider in buying pipe: initial purchase cost, cost of installation and cost of maintenance. Obtain by writing to Advertising Dept., A. M. Byers Co., Pittsburgh, Pa.

"YOUR PRODUCT" BROCHURE—Something new and different in the way of company brochures entitled "Your Product" is available from Columbus Bolt & Forging Co. Developed as a reference for service and facilities that are to be expected from modern sources of supply, the brochure gains a practical quality that permits the reader to quickly perceive applications of Columbus facilities to his own problems. Illustrates completeness of production requirements necessary to buyers of bolts, control rods, spring clips and forgings for automobiles, trucks, farm equipment, as well as related products for mining and construction machinery and other mass production items. Copies from Columbus Bolt & Forging Co., Dept. PR, Columbus 15, O.

—AE—

INVESTMENT CASTINGS — Crucible Steel Company of America announces a new 16-page booklet entitled "Crucible Accumet Precision Investment Castings." According to the booklet, Accumet precision investment castings have started a new trend in product design which now permits unmachinable high-temperature alloys, the co-cobalt base Rexalloys and Alnico magnets to be precision cast to close tolerances into almost any shape desired. Discussed are principal advantages Accumet castings afford including close tolerance, smooth finish, wide selection of alloys, high metallurgical quality and low costs. For your booklet, write Advertising Department, Crucible Steel Company of America, P. O. Box 88, Pittsburgh 30, Pa.

—AE—

ALL-PURPOSE LOADER—The Pettibone Cary-Lift, an all-purpose loader is described in a new, 36-page brochure released by Pettibone Mulliken Corp. Numerous photographs demonstrate how Cary-Lift can tackle a wide variety of yard and field loading tasks, from such primary functions as loading and unloading railroad cars, trucks and barges, to transporting and piling such hard-to-handle products as pipe, lumber, poles, construction materials and equipment. Ability to sort, pick, carry and place loads under all-weather operating conditions over unpaved, soft terrain. Featured is its usefulness for such tasks as handling dirt, snow, coal and aggregates with 1-yd. and 4-yd. slip-on buckets, or with scoop or bottom-dump buckets interchangeable with the fork. Available from Pettibone Mulliken Corp., 4700 West Division St., Chicago, Ill.

—AE—

INSULATION—Revision of the "85% Magnesia Insulation Manual" with 80 pages of text, illustrations and tables has been completed by The Magnesia Insulation Manufacturers Association. Contains an explanation of the chemical and physical properties of 85% Magnesia, together with new conductivity, density, and fire-resistance data. The new water-resistant magnesia insulation for underground conduits and other locations subject to flooding or excessive moisture is described. Contains recommended application techniques for hot piping and equipment. Available by writing the Association at 1317 F Street, N.W., Washington 4, D. C., stating company and title.

HEATING CONTROLS—A completely illustrated buyers guide, showing models, applications, and typical installations of G-E domestic heating controls has been announced as available from the General Electric Co. Designated GEC-1030, the 16-page two color publication contains photos, prices, ratings, dimensions, and ordering information on all standard heating control units. The booklet illustrates product features, and describes service facilities, the G-E exchange plan, and promotional aids available to heating control dealers. Available from the General Electric Co., Schenectady 5, N. Y.

MOTOR GRADER—A new highly-illustrated sixteen-page catalog has just been released by Galion on their model 503 economy motor grader. The numerous construction and operating features of this versatile machine are completely described. Equipment includes hydraulic shiftable moldboard, front-end scarifier, leaning front wheels, hydraulic circle turn, read-end bucket loader, windrow eliminator, "V" and straight snow plows, and bulldozer. Catalog No. 380 is available by writing The Galion Iron Works & Mfg. Co., Galion, Ohio.

—AE—

STEAM GENERATORS—Fully automatic "Packaged" Steam Generators for modern hospital buildings are treated in Bulletin No. 514, Johnston Brothers, Inc. Covers oil or gas or combination oil and gas, high pressure and low pressure generators. Answers the boiler question and shows typical installations in municipal, private, sectarian, and military hospitals. Request from Johnston Brothers, Inc., Ferrysburg, Michigan.

—AE—

BUILDING DESIGN—A new design manual covering use of welded wire fabric in reinforced concrete building construction has been prepared by Wire Reinforcement Institute, Inc. Liberally illustrated with current construction pictures and diagrams. Has 44 pages and includes comprehensive design data on many applications of fabric in concrete such as short-span construction, cinder concrete floors and roofs, tilt-up construction, cement gun work, and other current practices. Cover fireproofing structural steel, lightweight structural concrete, shrinkage and temperature reinforcement, and concrete slabs on ground. Copies free from Wire Reinforcement Institute, Dept. 50, 1049 National Press Building, Washington 4, D.C.

CLASSIFIED ADVERTISING

Minimum 3 lines.
Undisplayed: $1.50 per line.
Displayed: Same rate as General Advertising.

Positions Wanted: Undisplayed, 75c per line. Displayed, 50% off General Advertising Rates.
Box Number chargeable as one line.

Mail Box Number replies to:
AMERICAN ENGINEER
1121 15th St., N.W. Washington 5, D. C.

Business Opportunities

General Construction Company, located in the Carolinas with capacity contracts on hand desires capable individual to participate financially and actively in management and ownership. Box O-701, AMERICAN ENGINEER.

Courses, Training

ENGINEERS
Learn Construction Management

Complete course in the practical "know-how" of organizing and directing large projects on construction. For sample lessons and full particulars—write:

GEO. E. DEATHERAGE & SON
Construction Consultants
111——5th Ave. So. Lake Worth, Fla.

Position Available

SALES ENGINEERS

Leading bottling equipment manufacturer has several openings for qualified Sales Engineers in various locations in U.S.A. These positions offer excellent future and top compensation. Travel and hard work a requirement.

If you are familiar with the brewing, carbonated beverage, food, liquor or chemical industries and a graduate engineer with previous sales experience, please send complete resume. All replies will be held in strictest confidence. Personal interview will be arranged.

Box A-702
AMERICAN ENGINEER

Position Wanted

SUPERVISOR-ENGINEER TROUBLE SHOOTER

M.E. Age 29. At Present Line Supervisor in large Production Dept. Desire change to broader opportunities. Experience in Cost Reduction and Methods Improvement. Proven Supervisory and Technical ability. North or Central New Jersey area.

Box W-703 **AMERICAN ENGINEER**

Help Wanted

Registered Professional Engineers with blank years of experience in blank engineering. Must be competent to handle blank type of project. Exceptional opportunity for professional advancement. Salary commensurate with responsibility. Send resume. Box W-000, AMERICAN ENGINEER.

Mr. Employer . . .

Fill in the blanks and solve your personnel requirements.

AMERICAN ENGINEER CLASSIFIED ADS Reach over 36,000 RPE's

Miscellaneous

COMPACT TEN TOOL KIT

Ideal premium gift used in home, office, shop or car. Your firm name imprinted on each kit. B. Salzman Co. 1650 Bway, N.Y.

Placement Service

The following positions are listed with The Ohio Engineers' Placement Service, Inc., address below:

Positions Available

MACHINE DESIGN Central Ohio Mfgr. has position for someone with exp. in designing small and medium size automatic machinery. Knowledge of capping, canning or related machinery helpful. Ideal working conditions in new engineering laboratory. Good salary based on exp. & ability. (28-S-5)

Grad. MECHANICAL Engr. For Mgf. Design Engr. Several men needed to perform manufacturing process engr. functions of yokes, high voltage transformers and ferrite cores. (59-S-13)

STRUCTURAL Engr. 1-5 yrs. exp. in structural design and detailing. Cold formed structural exp. rather than hot formed Design of Industrial buildings helpful. (101-S-13)

PLASTICS ENGINEER For Production and Development Engineer. Exp. in formulation, evaluation and competitive analysis of all phases of dry blends and conventional extrusion compounds, plastisols, surface coatings, adhesives and sealers. Salary commensurate with education and ability. (103-S-13)

Grad. DESIGN ENGR. Of Instruments and Allied Controls: Should have about 10 yrs. exp. and will have the responsibility of handling redesign of present products and the designing of new units. Mfgr. Auto Instruments, Industrial temperature gauges, recorders and controllers. (103-S-14)

DESIGN Engrs. Central Illinois. Earthmoving Equip. Manufacturer. Openings in Product Design Dept. for exp. designers of prime movers and/or hauling units such as scrapers, cranes and buggies. Excellent employee benefits and advancement opportunities; Salary depends upon ability. (163-S-1)

HEAD of Dept. of Civil Engr. Grad. CIVIL with advanced degrees: For one of the country's outstanding Universities. Must have excellent teaching exp. record of 8 to 10 yrs. Former dept. head held 4 degrees, 3 from Purdue and one from Yale, and was director of several research projects at this university.

Positions Wanted

Reg. INDUSTRIAL Engr. — Grad. MECHANICAL Age 42. Courses after graduation in industrial management and engineering. Heavy exp. in Estimating, Production & Industrial Engineering. Over 8 years exp. at staff level in industrial and manufacturing engr. Desires position commensurate with ability and training with reputable company. (A-27)

Reg. INDUSTRIAL Engr. Age 30. 6 yrs. Industrial engr. exp. including inspector of Diesel engines, time study with Rubber Industry; Manager of Standards dept. of Paper Company. Interested in systems or Methods. (A-183)

Grad. Reg. ELECTRICAL Engr. Age 41. Exp. in designing and devel. home appliances with emphasis on high volume production. Class A design engr. in laundry equipment. $10,000 Salary range. (A-331)

(Small service charge)
THE OHIO ENGINEERS' PLACEMENT SERVICE, INC.
5 East Long St., Columbus 15, Ohio
Affiliated with OSPE

RCA Engineers Hold 45-Minute Strike

An after-the-last-minute strike of unionized engineers at the RCA plant in Camden, N. J. was called off after 45 minutes of picketing when an agreement was reached after an all-night bargaining session.

The engineers and technicians, represented by the Association of Professional Engineering Personnel, ESA, declined to make public the terms of the agreement pending ratification by the union members. Slightly over 1200 engineer and technician members of the union were said to be involved in the strike.

The same union also had a near-strike in the summer of 1953, which was averted by a last-minute settlement after the strike and picketing arrangements had been completed.

Roemmele President of NYSSPE

Herbert F. Roemmele of Port Chester, New York, has taken office as the new president of the New York State Society of Professional Engineers succeeding Thomas M. Linville of Schenectady. Mr. Roemmele is dean of students at The Cooper Union and is also director of alumni, student, and industrial relations.

Other new NYSSPE officers are: Lewis J. Sforzini, Rochester, first vice president; Franklin J. Johnson, Queens, second vice president; Patrick M. Corry, The Bronx, treasurer; and Richard B. Richardson, New York City, financial secretary.

Cooper Is Prexy In Union County

Frank P. Cooper of Cranford, N. J., has been elected president of the Union County Chapter of the New Jersey SPE. Other new officers are: David E. Trucksess, first vice president; Robert W. Morrison, second vice president; Leonard Shapiro, secretary; Joseph H. Baxter, Jr., treasurer; and Clifford Zimmer, state trustee.

High School Counseling By Travis Chapter P.E.'s

Members of the Travis Chapter of the Texas SPE have been active in counseling high school students interested in engineering. Among those participating in the Career Days at various schools have been A. T. Moses, H. K. Rigsbee, Frank Jessen, Percy Pennybacker, and William Allen.

Meeting

(Continued from page 25)

6. Cooperation with the Society of American Military Engineers in the accomplishment of our mutual objectives was discussed and it was unanimously agreed that this must be continued.

6.1. It can be reported that many mutual areas of activity were discussed at a luncheon meeting with Colonel F. H. Kohloss, Executive Secretary of the Society of American Military Engineers.

7. It is believed that the foregoing program is an action program that can have a positive effect on our National Defense.

7.1. It was agreed that as the result of this session more had been accomplished than in two years of correspondence.

7.2. It was voted unanimously to recommend that future N.S.P.E. budgets provide for at least one such meeting each year by the National Defense Committee and consideration be given to the advisability of a two day session if the necessary funds can be provided.

Board Action: Report endorsed.

Public Relations—A. R. Gruehr, P. E., reporting.

The public relations efforts of the National Society since the February report to the Board of Directors can be divided into two broad categories:

I. National Engineers' Week
II. General Public Relations

Both of these categories required writing and production work which was handled by the headquarters staff, under the direction of the Public Relations Committee.

I.

The 1955 observance of National Engineers' Week was the most extensive in the five-year sponsorship of this nation-wide event by NSPE. To date, at least five times as many reports on the Week have been received from the state societies and local chapters as were received in any previous year. These reports are more comprehensive in scope, indicating a wider participation in the observance of the Week in each community.

Of particular interest in the 1955 observance was the amount of radio and TV time obtained by the National Headquarters, the state societies and local chapters. Reports indicate that several hundred radio stations and perhaps as many as 60 television stations were used, including all the major networks. Some areas arranged one or more special half-hour TV programs at a favorable time. Spot announcements during the Week were made on numerous radio and TV network programs.

The headquarters staff is preparing a 12-page brochure, in two colors, entitled "The National Engineers' Week Story." This is an illustrated, descriptive booklet on the extent of the 1955 observance. It is to be used primarily to call attention of industrial management to the value of participation in the Week, and for the guidance of incoming Engineers' Week Chapter Chairmen.

II.

The general public relations effort of the National Society has been directed to the preparation and distribution of news releases concerning Society policy, the PR News Letters, and the preparations of printed matter for the promotion of special projects sponsored in whole or in part by NSPE. These latter projects include promotional work for the publication of the fourth executive research survey report of the Professional Engineers Conference Board for Industry; for the published study entitled "A Professional Look at the Engineer in Industry"; and for the publication of the compendium entitled "Professional Engineering Registration Laws."

Recommendations:

1. Comments and reports regarding various Engineers' Week activities indicate that some of the most effective programs were those designed to stimulate the interest of young people. Your Committee recommends that increased emphasis be given to "youth" programs by chapter public relations chairmen, and that any new ideas proving successful be reported to the Committee. *Word of Caution:* It would appear best to avoid any semblance of "recruiting." The most capable, the most imaginative young people will be more favorably impressed if we arouse their interest and let them reach their own conclusions.
2. It appears that television will be one of the most important media of communication available for use in promoting interest in National Engineers' Week. Therefore the Committee recommends that the Board of Directors consider ways and means for financing the preparation of a short (15- or 30-minute) film, based on a theme with wide popular interest, which can be distributed from the headquarters office and used throughout the National Society during the 1956 National Engineers' Week.
3. In carrying out the assignment referred to your Committee following the Board meeting of February 18-19, 1955, the Committee recommends that the Executive Director be authorized to seek accreditation of NSPE to the United Nations Department of Public Information.
4. The Committee recommends that where schools of journalism in universities and colleges are receptive to cooperation in the general public relations activities of NSPE, the state societies and local chapters should be encouraged to utilize these opportunities to the fullest advantage.
5. Your Committee has been assigned the problem of developing effective methods to impress upon the public the importance of improved teaching of mathematics and sciences in high schools. This is a joint effort with the Education Committee.

Several communities have experimented with assigning the most capable and most interested students in mathematics and sciences to one class with a good teacher. All available reports indicate that such classes have progressed far beyond the standard high school curriculum. The Committee recommends:

(a) That information regarding techniques of teaching the capable students be communicated to all chapters.
(b) That chapters organize committees of interested members to acquaint parents and teachers with the desirability of introducing such techniques.
(c) That such committees contact local school boards, school superintendents, and other appropriate officials, regarding the need for initiating such programs, and
(d) That the outcome of any such activities, whether successful or unsuccessful, be reported directly to this Committee for coordination.

Board Action: Report approved.

Resolutions—Vice Pres. R. J. Rhinehart, P. E., reporting.

Summary of Resolution 3-55

The resolution deals with the engineer in Federal service. It recommends, in part, that when the duties of a position can be properly described as engineering, that state registration should be a qualifying factor. Further, it states that salaries should be increased to attract qualified registered professional engineers to Federal service. Further, that recognition be given registered engineers through the display of certificates, name plates, and the like. Further, that the engineer be disassociated from the general service designations of the Classification Act and be given a professional designation consistent with his professional status.

Board Action: Approved.

Summary of Resolution 9-55

The resolution requests that the NSPE exercise its influence toward revision of the Federal Civil Service Classification System to provide for the establishment of a group of positions restricted to members of the learned professions, including the practice of engineering, qualification for the latter to consist of registration as a Professional Engineer in any of the several States and Territories of the United States.

Board Action: Approved.

Summary of Resolution 10-55

The resolution calls for the State Governments to establish State Engineering Advisory Boards to recommend concerning the technical aspects of proposed projects of an engineering nature. These State Boards would function as would a National Board of Engineering Review as recommended recently by Hoover Commission report.

Board Action: Approved.

Summary of Resolution 11-55

The resolution called upon officials of the Department of Defense to make renewed efforts to utilize professional engineers as much as possible in the high echelon planning of the Department.

Board Action: Approved.

Young Engineers—R. A. Gordon, P. E., reporting.

Your Young Engineers Committee has completed the survey of the Member State Societies, relative to the status, interest and active participation of the young engineer members in the work and activities of the various State Societies. A tabulation of the results of this survey, together with pertinent comments from the various Member State Societies was submitted to the Board at the North Carolina Meeting. Since that summary, three additional states have replied. While the Committee has not been able to secure 100% response to our questionnaire, we feel that obtaining replies from 33 out of the 39 State Societies represents that considerable interest was evidenced in this

questionnaire. The Committee was particularly pleased with those State Societies which showed added interest by accompanying their questionnaire with a supplementary letter of comment and explanation, relative to their special efforts in behalf of the young engineers.

The Committee feels that considerable interest and activity has been aroused in behalf of the young engineers, but there are still areas in which little or no interest in the young engineer is being evidenced, while on the whole the picture looks bright and encouraging.

The future of this program for young engineers will continue to need the encouragement, stimulation and assistance of the Parent Society at the national level, but a real program can only be made realistic when each Member State Society will build for itself an effective, practical program, which will appeal to the young engineer and thus enable each State Society to successfully enlist these future engineers into their ranks as a fully integrated part of their professional endeavors.

An analysis of the questionnaire, together with a review of the comments from individual State Societies, reported in the minutes of the North Carolina Board Meeting, will disclose that our chief weaknesses in enlisting young engineers into our ranks might be classified as follows:

1. Lack of any special program for assistance in the development of the young engineer at the state level.
2. An alarmingly low percentage of membership in the E.I.T. classification.
3. Lack of an active or effective program of recruitment for young engineer members.
4. Failure to encourage full participation of young engineer members in State Society activities.

You may note that the above comments were previously given to the Board at the North Carolina Meeting and the situation at the state level, while showing progress, has remained essentially the same.

The Committee feels that the information contained in this report should serve as an excellent guide to the various State Societies in developing a workable and dynamic approach to this problem by noting the experience and successes of their sister State Societies.

It is the committee's opinion that the future success and growth of NSPE will largely depend upon an awakening at the state level to this problem. Possibly in a single generation, the present leadership of NSPE will have disappeared, and if our profession and our professional society are to survive and prosper, we must find a way to interest and enlist the young engineers into our ranks or we will soon be known as just another society which tried and failed. Our profession must mean more to us than that.

The work of the future Young Engineers Committees will probably evolve around aiding and assisting individual State Societies in their efforts to build a strong and attractive young engineer program.

Board Action: Report received.

Neff

(*Continued from page* 12)

according to schedule, and we know that the members will be proud of the finished structure—as well as appreciative of the assistance it will lend to the efforts of the headquarters staff, now separated in two different office buildings because of the space problem. A goodly percentage of the membership is already represented in the construction program through individual purchases of Building Fund Participation Certificates, while a number of certificates in $100 denominations are still available for those who are interested in contributing to the project.

THUS we move ahead into the new administrative year. In the fully democratic spirit which has always characterized our Society, your officers invite the constructive criticism and advice of all of our members. It is our goal and intention to provide the professional service that the membership wants. It is our hope that we will fullfill the trust that has been placed in us to the satisfaction of all.—***End.***

40,000 Plus!

Yes, more than 40,000 copies of this issue of the AMERICAN ENGINEER will be printed. This gives the publication a circulation far above many of the other leading engineering publications. And the AMERICAN ENGINEER, of course, reaches thousands more *registered professional engineers*, than any other journal.

Advertisers' Index

Acme Fire Alarm Co., Inc. 1
Adache & Case, Engineers 40
Albright & Friel, Inc. 40
Applied Psychology Corp. 42
Ark Engineering Company 40
Michael Baker, Jr., Inc. 40
Elmer S. Barrett Associates 40
E. D. Barstow & Associates 40
Paul Berg 38
Bettenburg, Townsend & Stolte 38
Black & Veatch 38
George W. Brandt, Engineer 40
Roger Barrett Bross 38
Brown & Blauvelt 39
Builders Estimating Service 42
C. L. Calkins 38
Capitol Engineering Corporation 40
Commonwealth Associates, Inc. 38
Consoer, Townsend and Associates 38
Copperweld Steel Co. 4
Cormit Engineering Co. 41
Crescent Engineering Company, Inc. 38
Geo. E. Deatherage & Son. 47
DeLeuw, Cather & Company 38
Thomas E. Duce Associates 41
Eastern Heat Treating & Brazing Corp. 42
Ehrco Die Casting Service 42
Engineers Testing Laboratory, Inc. 41
Eustis Engineering Company 38
Fay, Spofford & Thorndike 38
Orrin E. Fenn 38
Ferguson-Gates Engineering Company 42
Forrest and Cotton 41
Foster & Cafarelli 39
Frazier-Simplex, Inc. 40
Freese & Nichols 41
Gannett, Fleming, Corddry & Carpenter, Inc. 40
General Electric Co. Back Cover
Gustave M. Goldsmith 40
Green Engineering Co. 40
Greer & McClelland 39
Hall Laboratories, Inc. 40
Hardesty & Hanover 39
Frank E. Harley & Associates 39
Frederic R. Harris, Inc. 39
Heat-Timer Corp. 8
The Hinchman Corporation 38
Howard, Needles, Tammen & Bergendoff 39
J. Z. Jizba 39
Kaiser Engineers 38
Kennedy-Riegger Drilling Co., Inc. 42
Kirk & Cowin 38
Kuljian Corporation 40
Law-Barrow-Agee Laboratories, Inc. 38
Lawrie & Green & Associates 40
Lockheed Aircraft Corp. Cover II
Lockwood & Andrews 41
Louis J. Lucas 38
Madigan-Hyland 39
Manu-Mine Research & Development Co. 42
Emmet J. McDonald 40
Metcalf & Eddy 38
Merritt & Welker 38
Modjeski and Masters 41
George V. R. Mulligan, P.E. 38
Niagara Blower Co. 9
H. C. Nutting Co. 40
James P. O'Donnell 39
Oklahoma Testing Laboratories 40
Ozalid Division, General Aniline & Film Corp. 7
Palmer & Baker, Inc. 38
Parsons, Brinckerhoff, Hall & MacDonald 40
Revolator Company 4
Cyrus Wm. Rice & Co., Inc. 41
Robert and Company Associates 38
B. Salzman Co. 47
Seelye, Stevenson, Value & Knecht 40
Singstad & Baillie 40
South Florida Test Service 38
D. B. Steinman 40
Syska & Hennessey, Inc. 40
Tippetts-Abbett-McCarthy-Stratton 40
Leonard M. Todd 40
Toledo Testing Laboratory 40
Harry L. Tooker & Associates 41
United States Testing Company, Inc. 39
Emerson Venable 41
Warren-Knight Co. 6
Water-Tight Underground Conduit 42
Wilton Smith Whipp 41
Whitman, Requardt and Associates 38
A. W. Williams Inspection Co. 38
Wilson & Company 38
The Wright Engineers 42
J. A. Zurn Manufacturing Co. 5

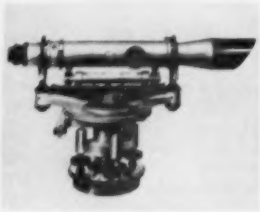
What's New

AMERICAN ENGINEER July, 1955
1121 FIFTEENTH ST., N.W., WASHINGTON 5, D. C.

Please send information on Item 1 to:

Name .....
(Title)
Company .....
Street .....
City and Zone ..... State .....

CONVERTIBLE LEVEL, 8 ADVANTAGES — Item 1



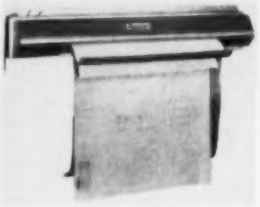
Warren-Knight's new 1955 Model 40 convertible level adds 8 additional features. Cast brass internal focusing telescope is completely sealed against dust and dirt. Has 24 power coated optics with cross wires on a glass reticule. Time-saving features include a circular level mounted on top plate cover, enabling a quick check on instrument set-up and fast level position approximation. Maintenance lessened by adding a nylon pinion bearing, a steel center, and a level bar cast in one piece with the circle cover. Glass protects circle and vernier grads.

AMERICAN ENGINEER July, 1955
1121 FIFTEENTH ST., N.W., WASHINGTON 5, D. C.

Please send information on Item 2 to:

Name .....
(Title)
Company .....
Street .....
City and Zone ..... State .....

ECONOMICAL DRAWINGS REPRODUCTION — Item 2



The Rotolite, a new, low-cost machine which in seconds makes white copies of translucent printing, drawings, photos, etc., up to 42 inches wide and in any length desired, is announced by the Rotolite Co. Can be plugged into any standard wall socket and requires only a minimum of wall, floor or desk space. No plumbing or special wiring necessary. Unusually easy to operate. At no time does the developing operation require the mixing of chemicals or the use of liquids in trays, according to the manufacturer.

AMERICAN ENGINEER July, 1955
1121 FIFTEENTH ST., N.W., WASHINGTON 5, D. C.

Please send information on Item 3 to:

Name .....
(Title)
Company .....
Street .....
City and Zone ..... State .....

HOLDS ENGINEERING PLANS — Item 3

Plan Hold, for holding building or engineering plans, has been designed to fit any existing plan rack or file and will hold 1 or 150 prints. No punching or drilling of holes or mutilating of plans in any way. Prints may be added or removed quickly and easily without disturbing other prints. Made of high grade satin-finished aluminum. All corners and edges rounded. Light and easy to handle, both in the office and on the job. Soft plastic tips protect against scratching or marring of desks and reference tables.

AMERICAN ENGINEER July, 1955
1121 FIFTEENTH ST., N.W., WASHINGTON 5, D. C.

Please send information on Item 4 to:

Name .....
(Title)
Company .....
Street .....
City and Zone ..... State .....

STEEL TAPE RULE IS LONGER, WIDER — Item 4

The growing trend to longer, wider blades in steel tape rules is evident in the Carlson "Super Chief", a ¾" wide, 16' long steel tape rule manufactured by Carlson & Sullivan, Inc. Sixteen rigid feet of ⅝" wide white blade makes long overhead and reach-in measurements easier. To speed measuring, a flush-folding re-wind crank reels the 16' blade in and out smoothly, without back-lash. The compactly designed 2½" pocket-size metal case weighs only 6¾ oz. Big black numerals are highly visible. Blade surface specially crackproof processed.

AMERICAN ENGINEER July, 1955
1121 FIFTEENTH ST., N.W., WASHINGTON 5, D. C.

Please send information on Item 5 to:

Name .....
(Title)
Company .....
Street .....
City and Zone ..... State .....

SMALL 3-WAY ANGLE-SET VISE — Item 5

The Universal Vise and Tool Co. announces a new and smaller Universal 3-Way Precision Angle-Set Vise, designed particularly for compound and simple angle grinding. Has a 3¼" jaw opening with jaws 2¾" wide. Jaw height 1". Vise only 4¼" high in flat position and 9¾" high when set at maximum angle. Fully adjustable in three planes with 360° swivel base and both cradles are adjustable to 90°. Base and cradles fully graduated. Has square base for squaring against rail of magnetic chuck. Weight 20 pounds.

This column describes new products of general interest to professional engineers. For further information, fill in the coupon provided and mail to the AMERICAN ENGINEER.

K & E'S NEW STABILENE FILM

Item 6

A new dimensionally stable reproduction material, Stabilene film, is now being made available to private industry by Keuffel & Esser Co. of Hoboken, N. J. Highly transparent, Stabilene film has many uses, including lofting, optical comparator work, and printed circuits, as well as map making. Has fibre-free drawing surface, great flexibility and initial tear strength. Made with several forms of coating to accept either pen and ink drawings, scribings or light-sensitive solutions.

AMERICAN ENGINEER July, 1955
1121 FIFTEENTH ST., N.W., WASHINGTON 5, D. C.

Please send information on Item 6 to:

Name ..... (Title)
Company .....
Street .....
City and Zone ..... State .....

ROD TYPE, WIND-FREE PLUMMET

Item 7

The David White Company, of Milwaukee, has just announced two, new wind-free plummets, one an optical type, the other a telescopic rod type. Plummet pictured at right is fully automatic, completely unaffected by wind. Telescoping rod made of high strength aluminum alloy tubing for long life and accuracy. Fitted with 8 minute level vial, giving an accuracy of 1/64" which can be reduced to 0 by adjustment. Wide range of adjustment makes it applicable to almost any kind of tripod, both European and American standard.

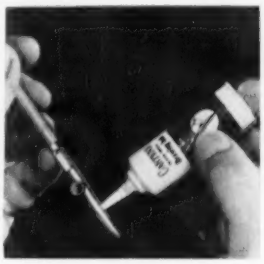
AMERICAN ENGINEER July, 1955
1121 FIFTEENTH ST., N.W., WASHINGTON 5, D. C.

Please send information on Item 7 to:

Name ..... (Title)
Company .....
Street .....
City and Zone ..... State .....

NEW SQUEEZE BOTTLE DRAWING INK

Item 8



The Carter's Ink Co. announces a new Squeeze Bottle Drawing Ink. Pin point applicator speeds pen or instrument filling, prevents spilling or drying out, gives just the right amount of ink, uses up the last drop. Ink is electro-polarized so no shaking is necessary. Uniform color throughout bottle. Makes clean-cut lines without doubling back. Completely opaque . . . no grey areas, no chipping or peeling. Send coupon for FREE bottle.

AMERICAN ENGINEER July, 1955
1121 FIFTEENTH ST., N.W., WASHINGTON 5, D. C.

Please send information on Item 8 to:

Name ..... (Title)
Company .....
Street .....
City and Zone ..... State .....

SITE FOR ENGINEERS RULE

Item 9

Rule-Site is said to eliminate the common surveying error caused by reading the wrong graduation of the folding rule. First surveyors target made for the engineers six foot folding rule. Designed for the line and grade engineer, surveyor or architect who uses the folding rule as a surveying rod. Auxiliary scale graduations (⅛" or 0.01') are for quick determination of offsets. Made of aluminum and brass with baked enamel finish, sturdy, lightweight, pocketsize Rule-Site passes rapidly over all folding engineers rules.

AMERICAN ENGINEER July, 1955
1121 FIFTEENTH ST., N.W., WASHINGTON 5, D. C.

Please send information on Item 9 to:

Name ..... (Title)
Company .....
Street .....
City and Zone ..... State .....

TWO NEW WING DIVIDERS

Item 10

Fine settings and accuracy are assured in two new wing dividers announced by Stanley Tools. One, No. 57 (shown left) has two solid legs for scribing circles or arcs on hard or rough surfaces. The other, No. 58, functions as a divider or compass by virtue of a removable leg which is replaceable by a pencil. Settings are secured by a full-thread engagement of clamping nut. Hairline fine adjustment is made by a tension spring working in conjunction with a locked-on adjusting nut. Leg points have been hardened and tempered.

AMERICAN ENGINEER July, 1955
1121 FIFTEENTH ST., N.W., WASHINGTON 5, D. C.

Please send information on Item 10 to:

Name ..... (Title)
Company .....
Street .....
City and Zone ..... State .....

Dr. F. Hubbard Horn, A.B., Oberlin (1937), Ph.D. in Chemistry, Johns Hopkins (1942), came to the General Electric Research Laboratory in 1946. With the equipment shown, he has been able to extend the range of density measurement to a new order of precision. Dr. Horn's work includes pioneering studies of crystals and their imperfections.

Progress toward better transistors

Dr. F. Hubbard Horn seeks more uniform semiconductor crystals at the General Electric Research Laboratory

Recent work by Dr. F. Hubbard Horn has been likened to "measuring and weighing haystacks to find needles in them." The haystacks are crystals of extremely pure silicon. The needles are the impurities and imperfections left in silicon after the crystals have been "zone-melted" and grown in a process developed by Dr. Horn and his associates at the General Electric Research Laboratory.

Dr. Horn has adapted and developed a density-measurement method — involving free suspension of crystals in a liquid column of varying density — which is sensitive to variations of a millionth of a gram per cubic centimeter. These measurements, combined with x-ray techniques, make it possible not only to ascertain the *presence* of impurities, but actually to locate *where they are* in the crystal. This General Electric research will mean greater uniformity in transistors and other silicon semiconductor devices that can operate at high temperatures. It opens the way to wider basic knowledge and important progress in a new field of electronics.

Progress Is Our Most Important Product

GENERAL ELECTRIC